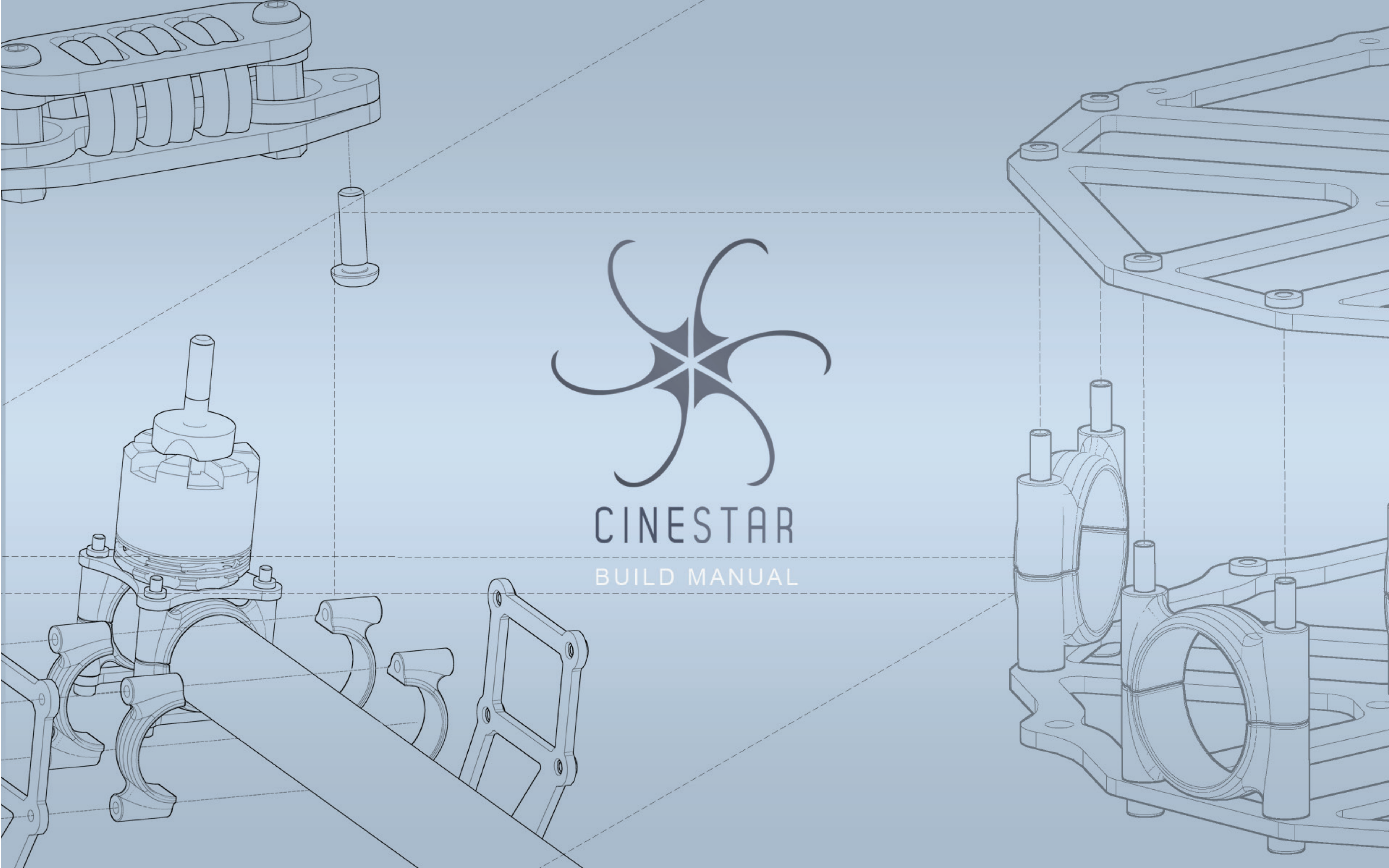




CINESTAR

BUILD MANUAL



SAFETY WARNING AND DISCLAIMER

Thank you for purchasing the CineStar 6 by FreeFly Systems. The CineStar 6 is not a toy and should be operated with extreme care, as improper operation can cause serious personal injury and damage to property. The CineStar 6 should not be flown over or around people, power lines or other aircraft. It is important to always check the CineStar 6 and its components prior to operation. Never attempt to touch the CineStar 6 when the propellers are moving. As with any multi-rotor helicopter, the CineStar 6 is a complex and technical machine. Novice pilots should invest sufficient time on a flight simulator and seek training from an experienced pilot prior to operation. A flight simulator is no substitute for training with an experienced pilot, particularly when it comes to learning how to safely operate the CineStar 6. Novice pilots should never fly without the supervision of an experienced pilot.

FreeFly Systems disclaims all warranties, whether express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. FreeFly Systems does not assume any liability, whether direct or indirect, from the use of the CineStar 6. FreeFly Systems shall not be liable for any special, incidental or consequential damages to persons or property caused by the CineStar 6. In no event shall FreeFly Systems be liable for personal injury up to and including death.

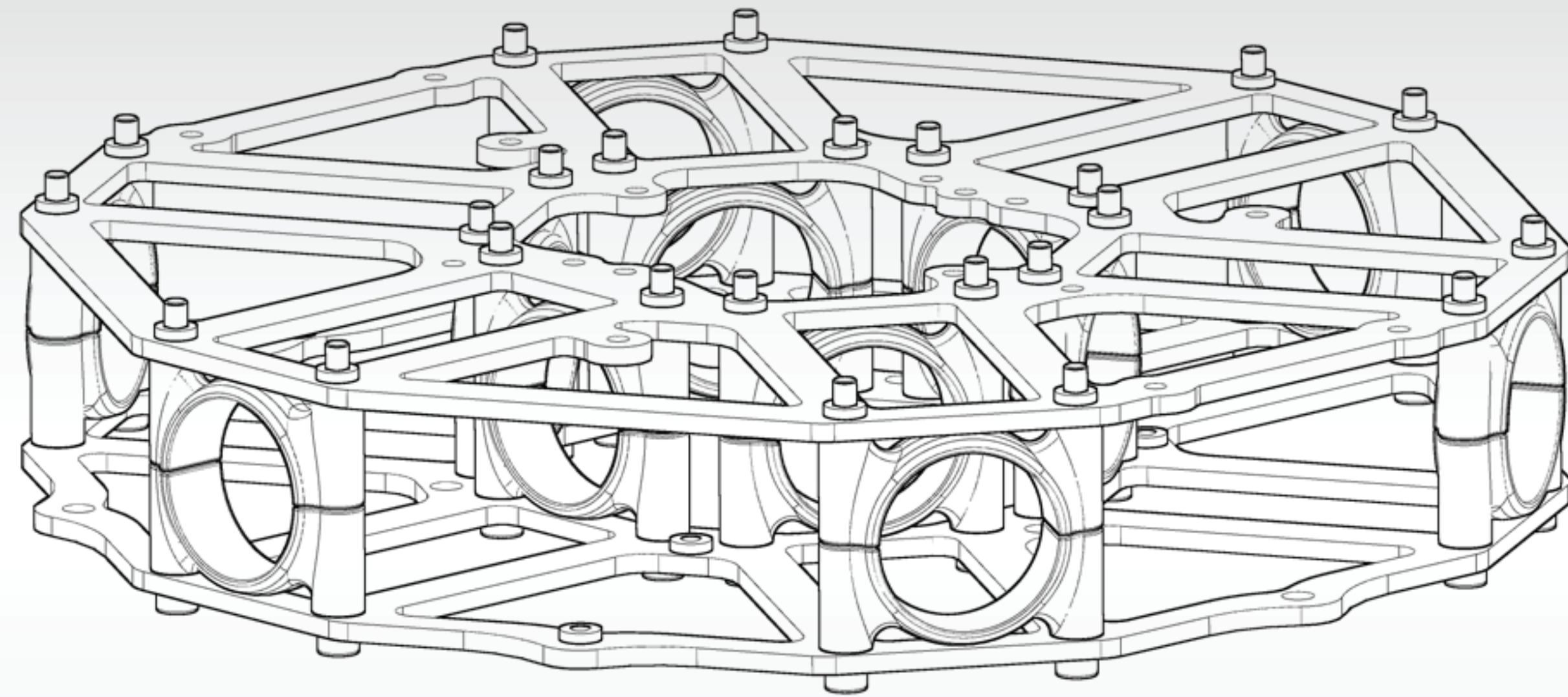
It is your responsibility to perform a full system check of the CineStar 6 prior to flight. It is your responsibility to learn how to safely operate the CineStar 6 and to adhere to all applicable rules and regulations. Fly at your own risk.

TECHNICAL FOREWORD

Below are a few tips from the designers to aid in assembly, flight and maintenance of the CineStar 6. The CineStar 6 is designed to be a professional heavy lift multi-rotor helicopter. As such, it is very important to take your time and assemble with care.

Here are a few important tips in assembling the CineStar 6:

- + Always use threadlocker on any screw going into either aluminum or steel. This will ensure that the screws will not come loose even under the vibrations encountered in flight. We recommend using “Loctite 222MS Low Strength Purple Threadlocker,” as it is intended for the small screw sizes found on the CineStar 6. It is important to use this product or a similar strength screw retainer adhesive, as stronger variations, such as Green or Red Loctite, are too strong for the small screw sizes used on the CineStar 6 and may make disassembly for repair/service impossible.
- + Be careful working with the carbon fiber booms and frame. We try to make sure that the edges on the carbon fiber are smooth and safe, but carbon can still have sharp edges which can cut your fingers and/or chafe delicate electronic wires. Any time a wire has to make a bend around the carbon fiber booms or frame, we recommend using some kind of protective sleeve (e.g., shrink tubing, nylon braid, etc.), so that the vibrations from the motors will not cause the wire to chafe on the edge of the carbon fiber. Carbon fiber is also conductive, so it is very important to make sure that all flight components are appropriately insulated.
- + Always remove the props when you are making a change to the configuration of the CineStar 6. It can seem like a pain at the time to remove the props, but it has prevented many crashes for the CineStar development team. We always recommend first testing the CineStar 6 with the props removed to make sure that the motors are spinning in the correct direction and that the motor assignment is correct with respect to your flight control board. If you have either of these wrong, the CineStar 6 will be uncontrollable.
- + Always install your selected flight control system in accordance with the manufacturer’s instructions.

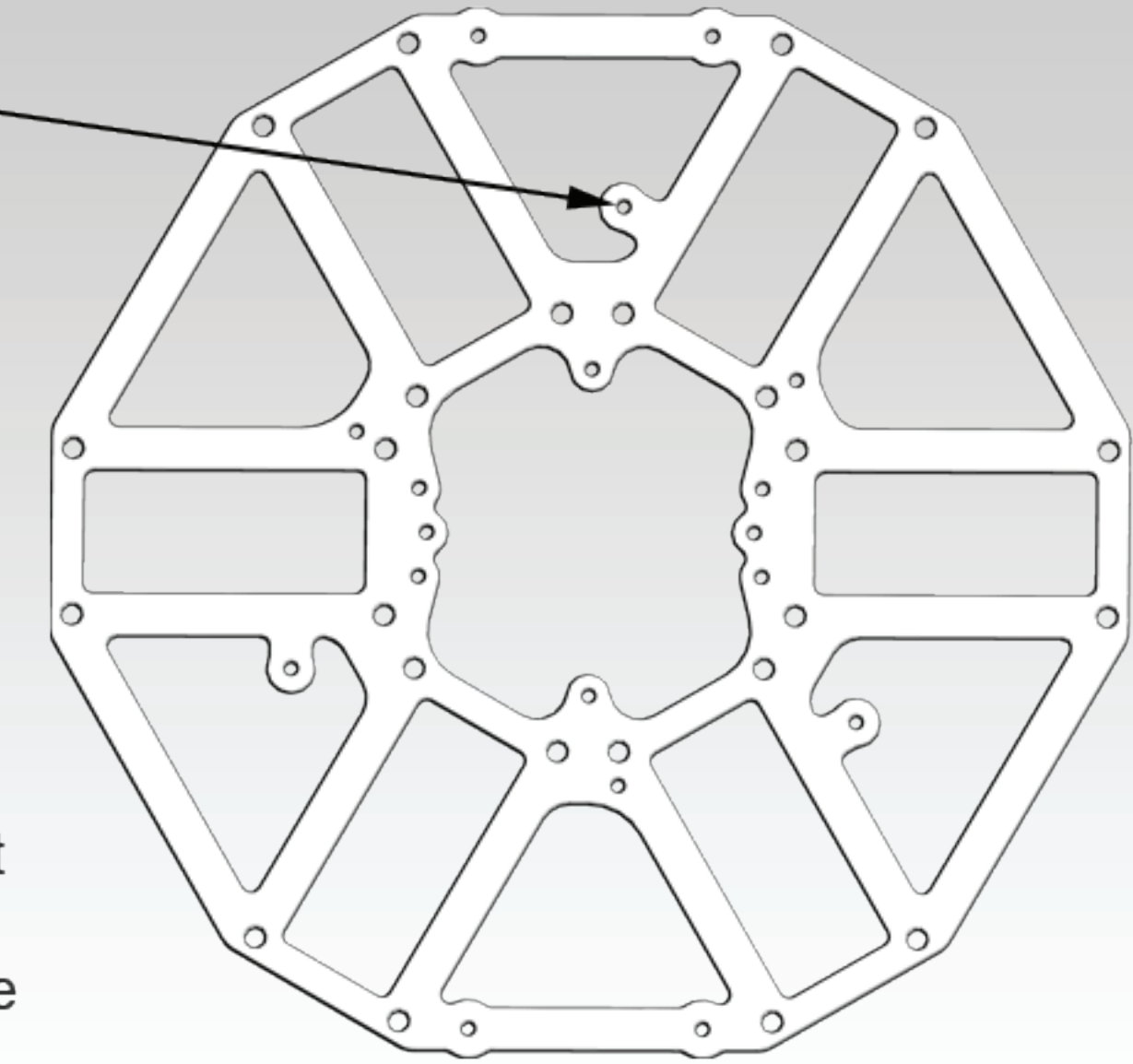


1

MAIN FRAME
MF1.1 - MF1.12

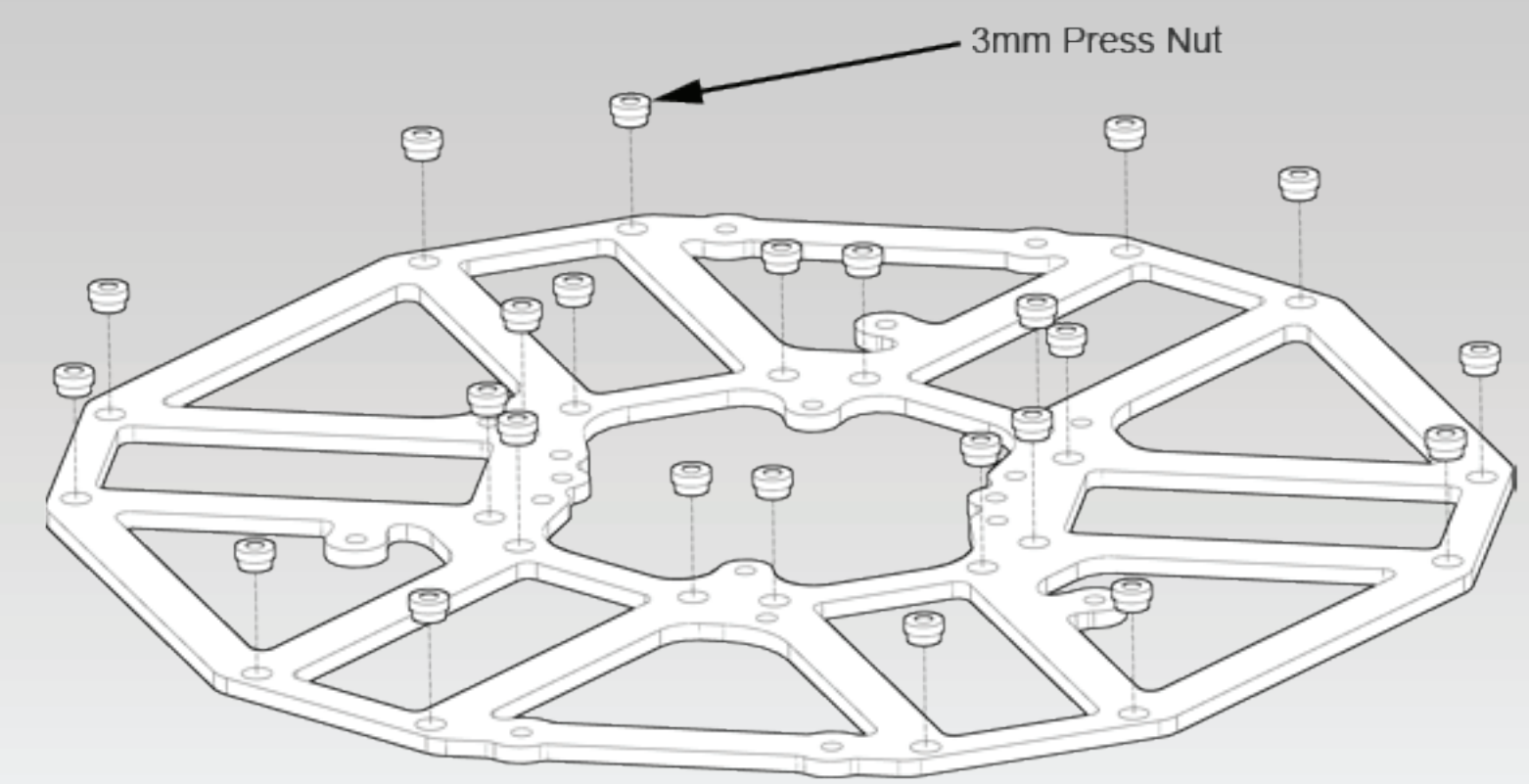
1

Please note the orientation of the top frame plate. With the plate lying flat on the work bench this hole should be on the right side of the triangle cutout.



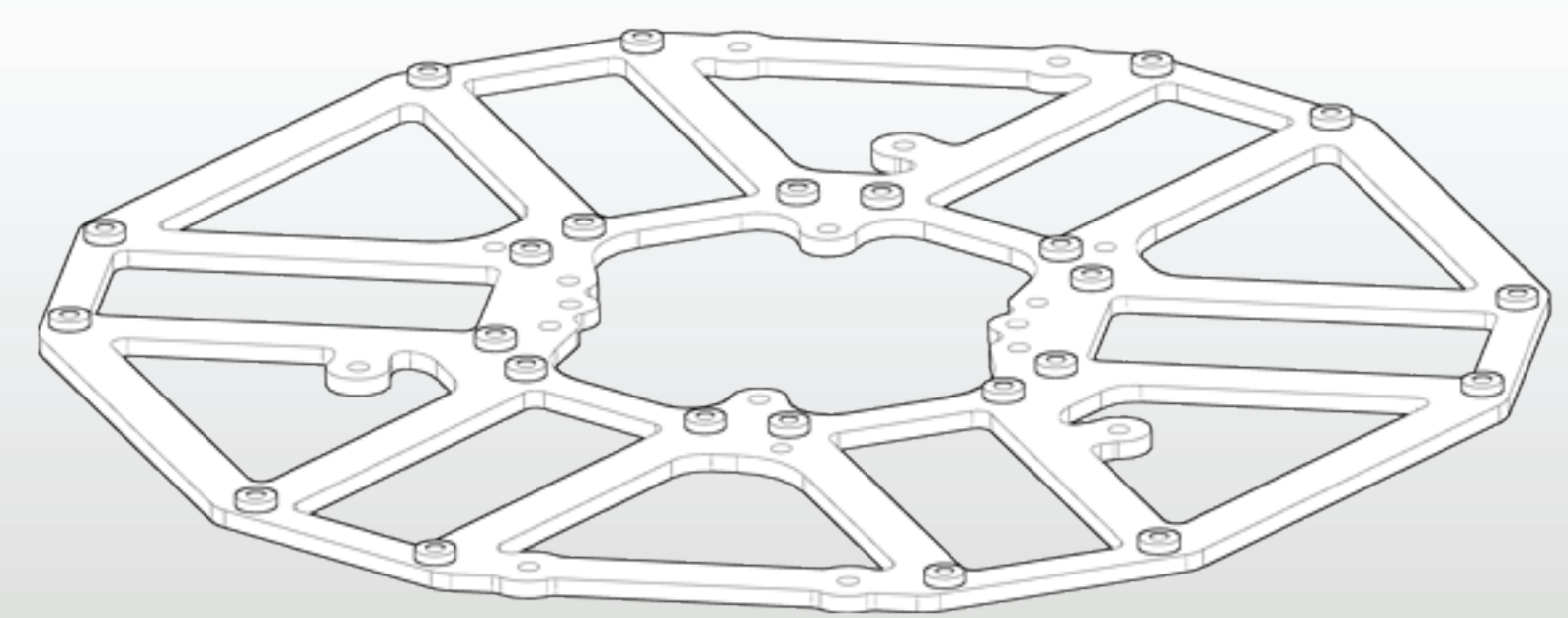
MF1.1 Take a moment to familiarize yourself with the top frame plate. There are 3mm holes and larger 4.4mm holes. The 4.4mm holes are used for the press nuts. It is important to observe the proper orientation, so that the press nuts are installed on the correct side of the top frame plate.

2



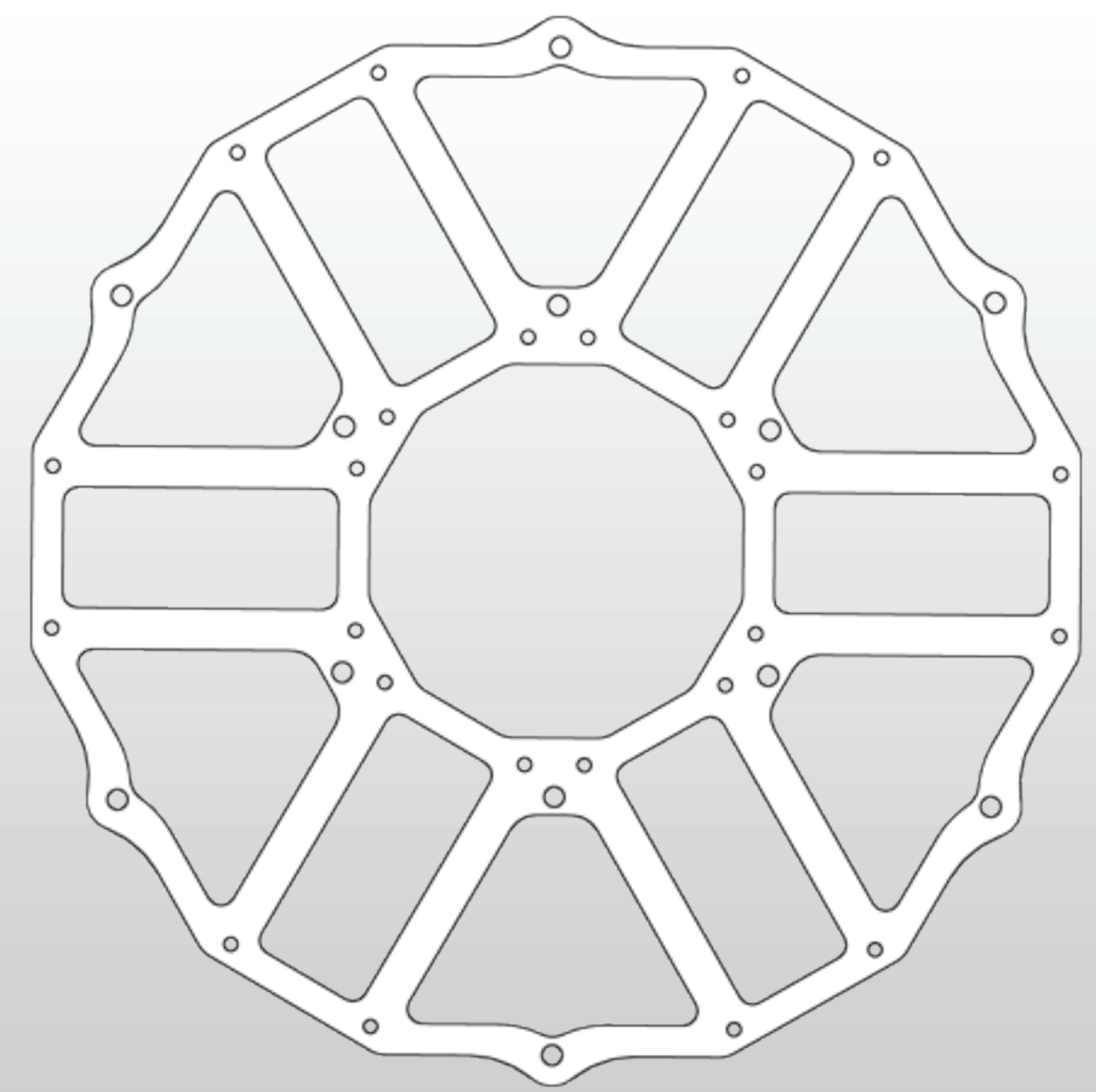
MF1.2 Install twenty-four (24) 3mm press nuts into the top frame plate. We recommend using a small arbor press to aid in installation. It will take a moderate amount of force to install the press nuts and you will feel a slight click when they are fully seated. Be careful to support the back side of the top frame plate to avoid over stressing the plate.

3



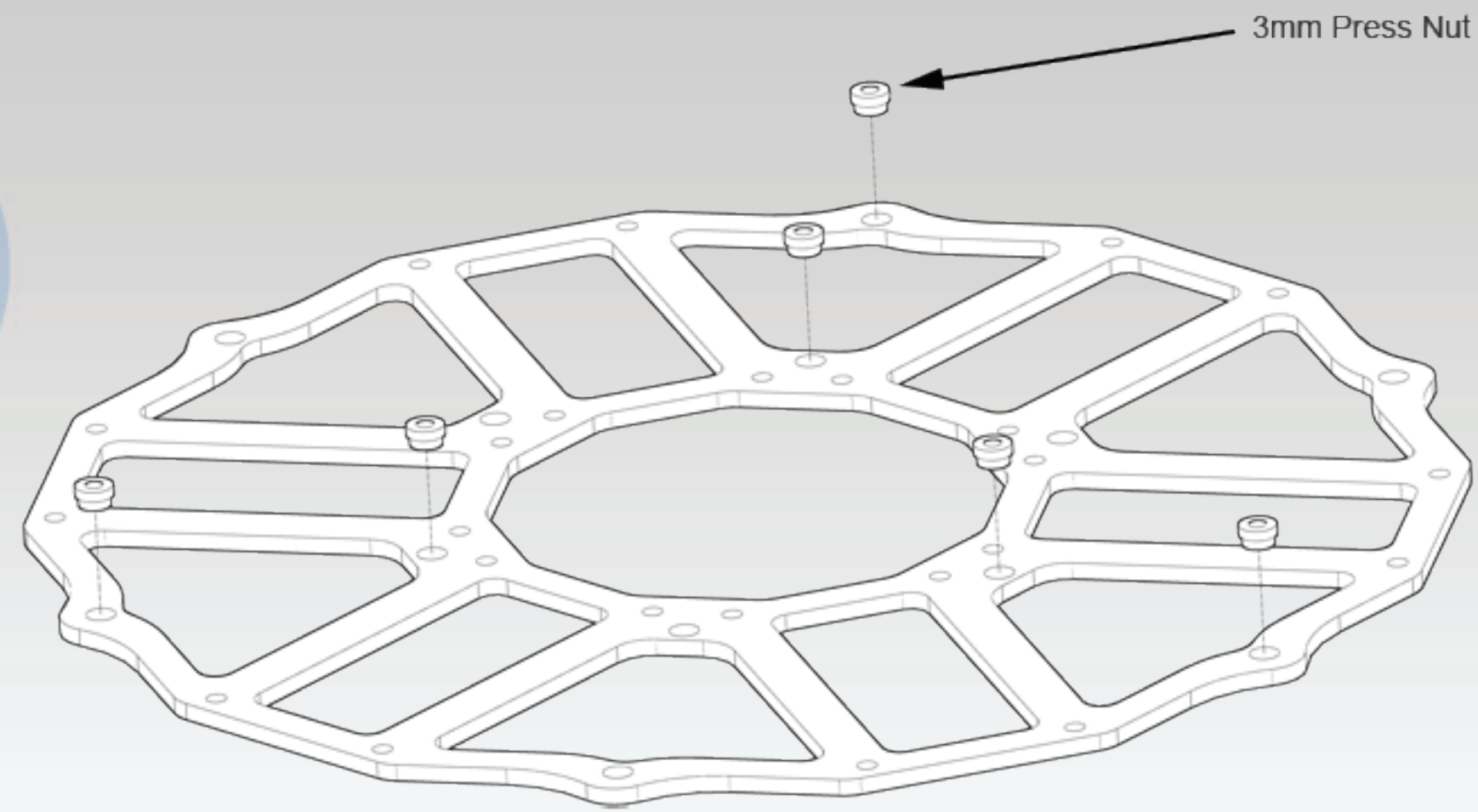
MF1.3 All twenty-four (24) press nuts fully seated.

4



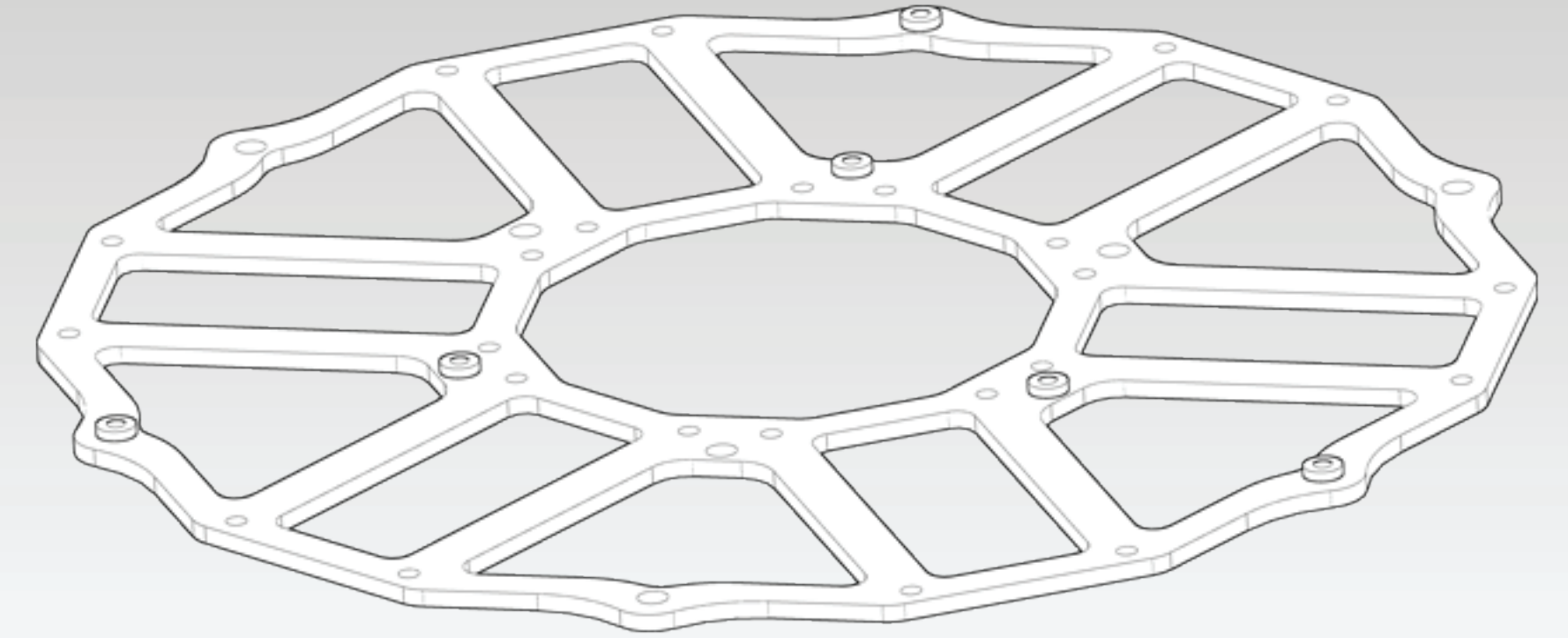
MF1.4 Take a moment to familiarize yourself with the bottom frame plate. This plate is symmetrical, so it is only important that all the press nuts are installed on the same side of the plate.

5



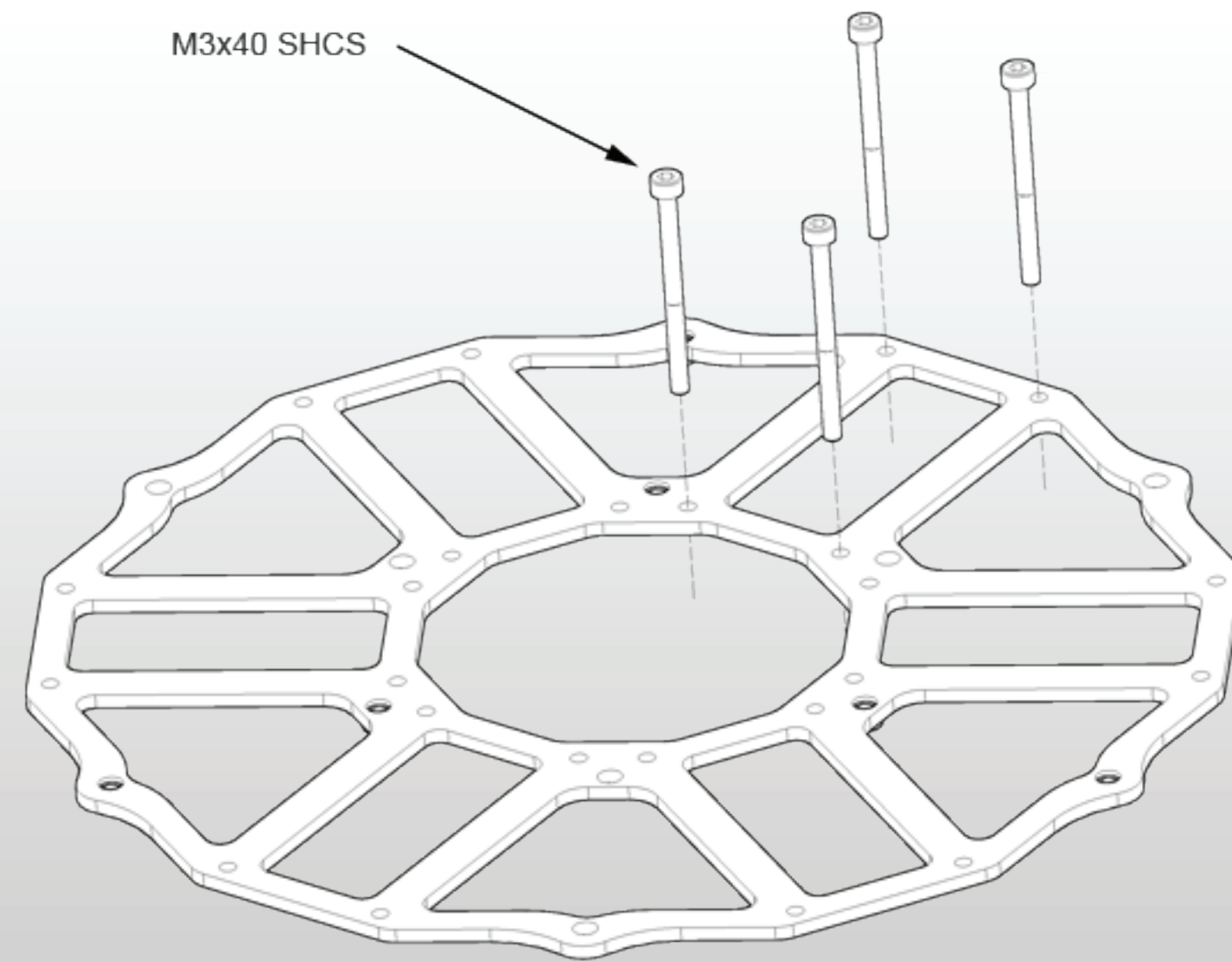
MF1.5 Install six (6) press nuts into the bottom frame plate.

6



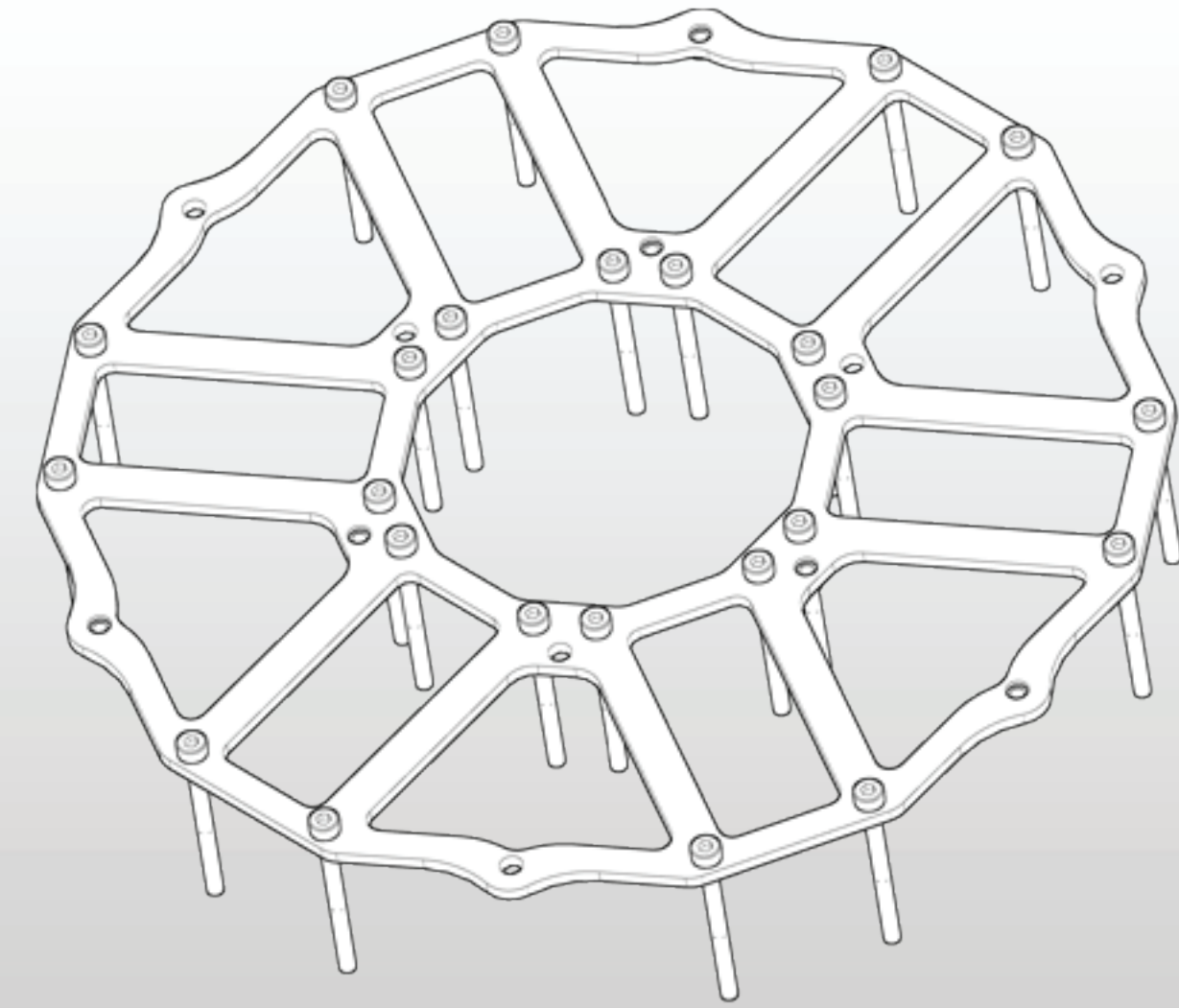
MF1.6 All six (6) press nuts fully seated.

7



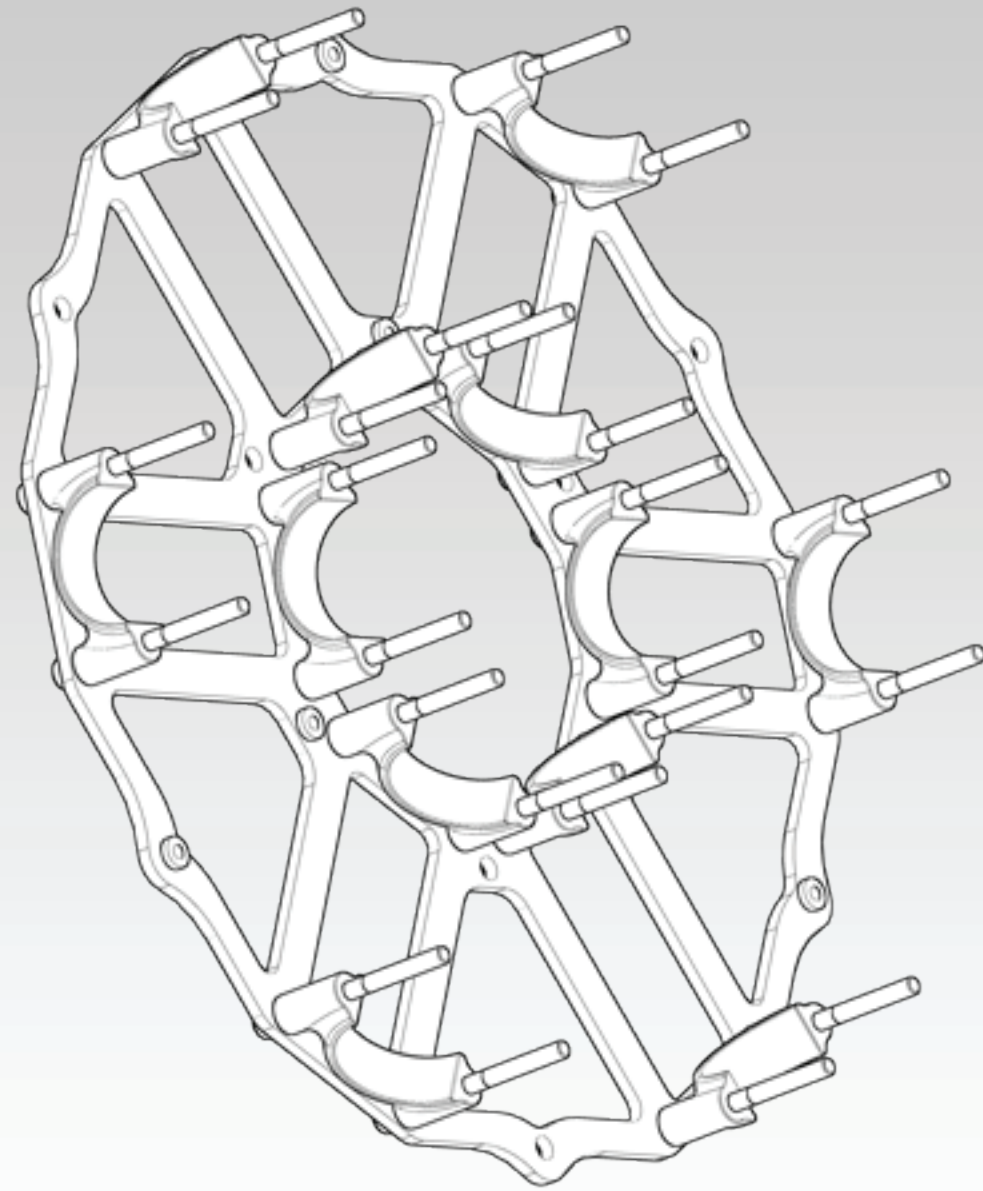
MF1.7 Install the twenty-four (24) M3x40mm screws through the bottom frame plate. Please note that the orientation of this image has flipped and we are now looking at the bottom of the bottom frame plate.

8



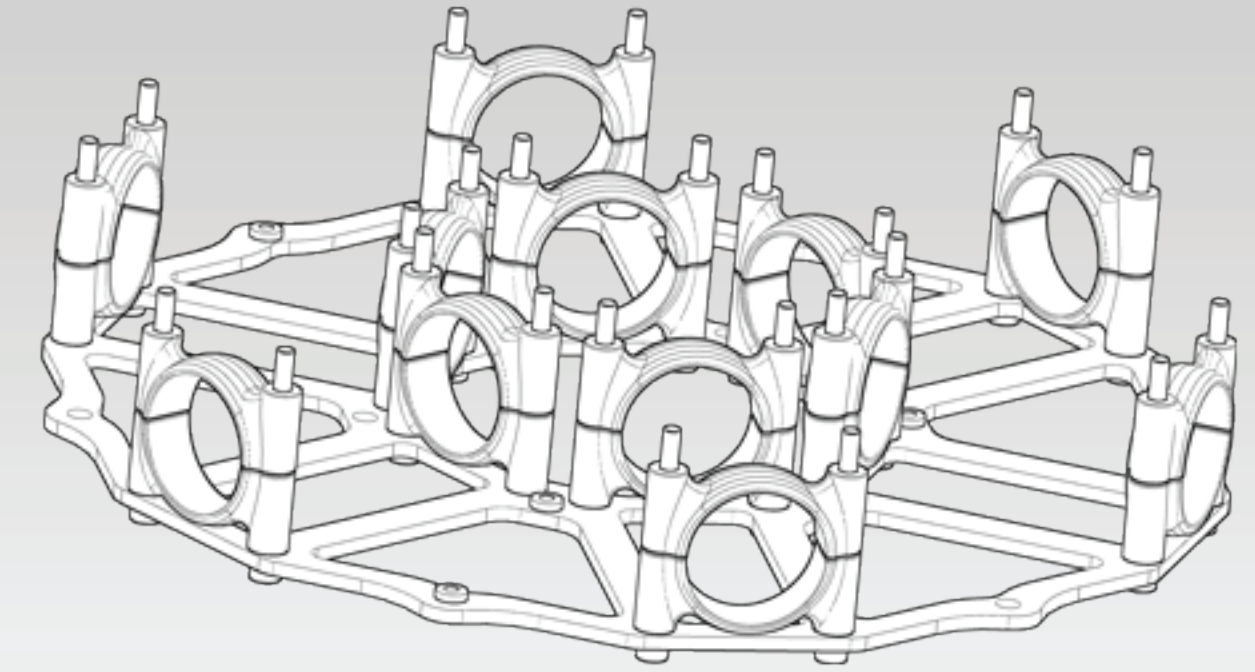
MF1.8 All twenty-four (24) M3x40 mm screws installed.

9



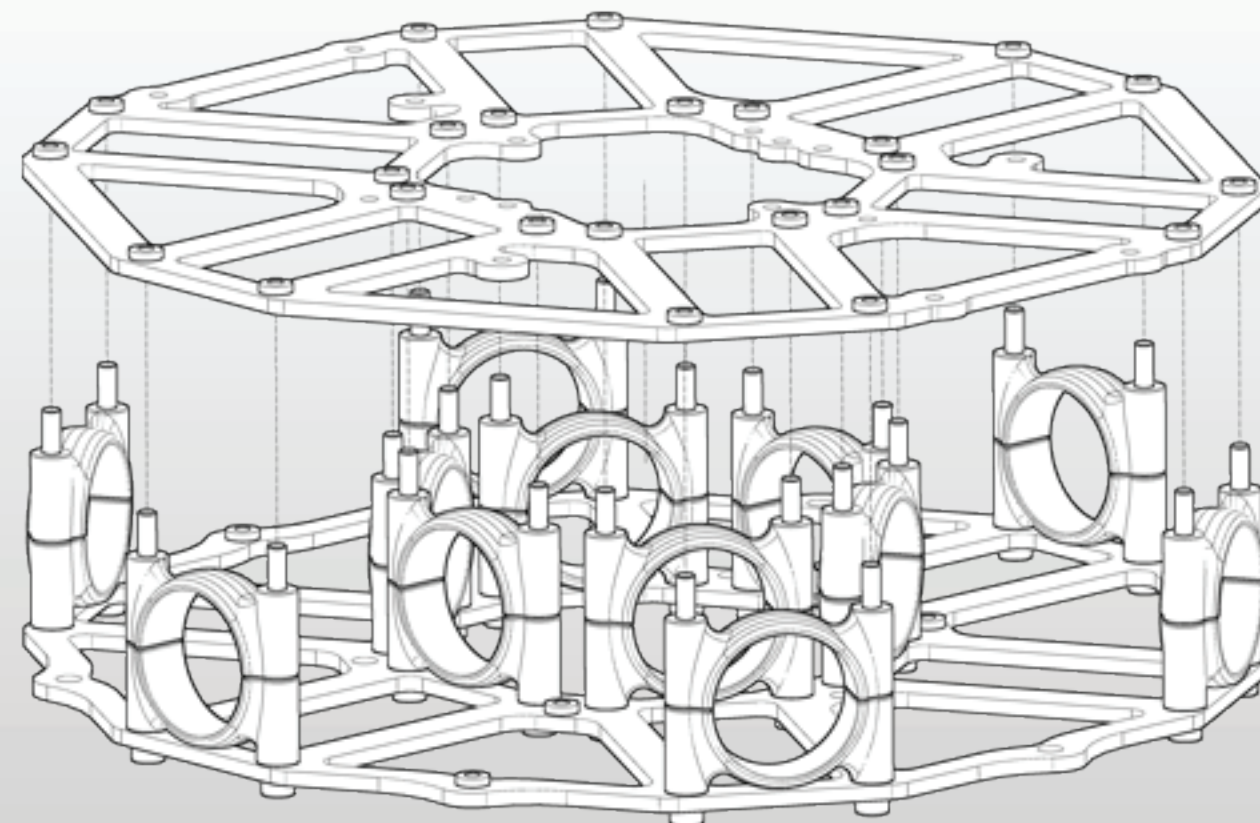
MF1.9 Install the twelve (12) clamp halves onto the M3x40 screws.

10



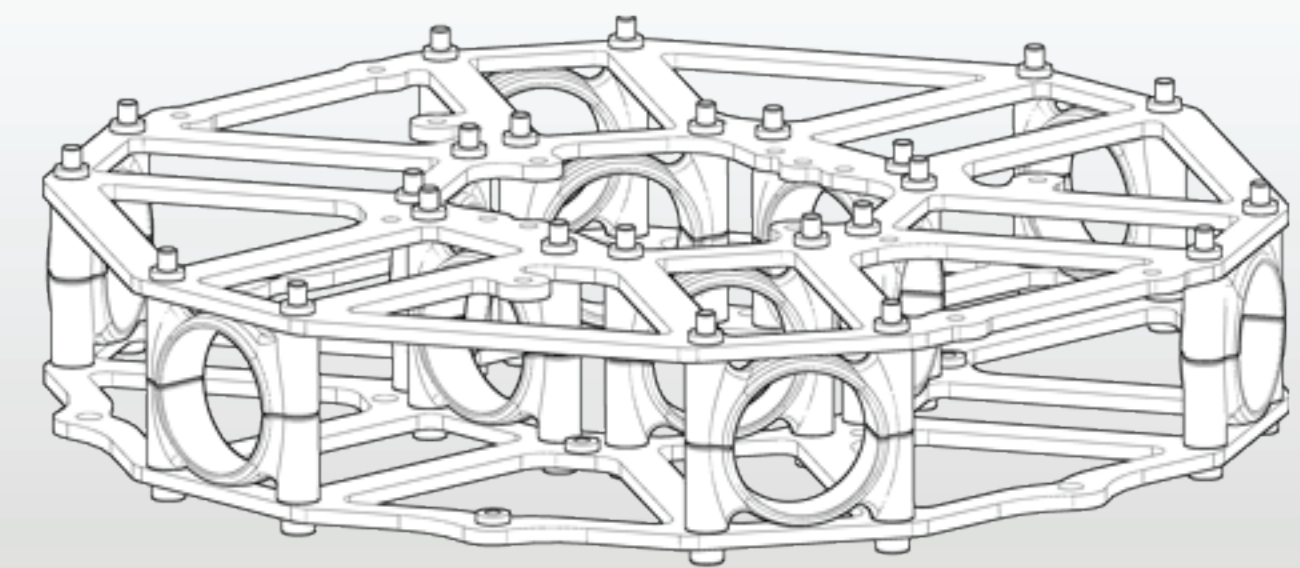
MF1.10 Install the twelve (12) corresponding clamp halves on top of the ones previously installed.

11

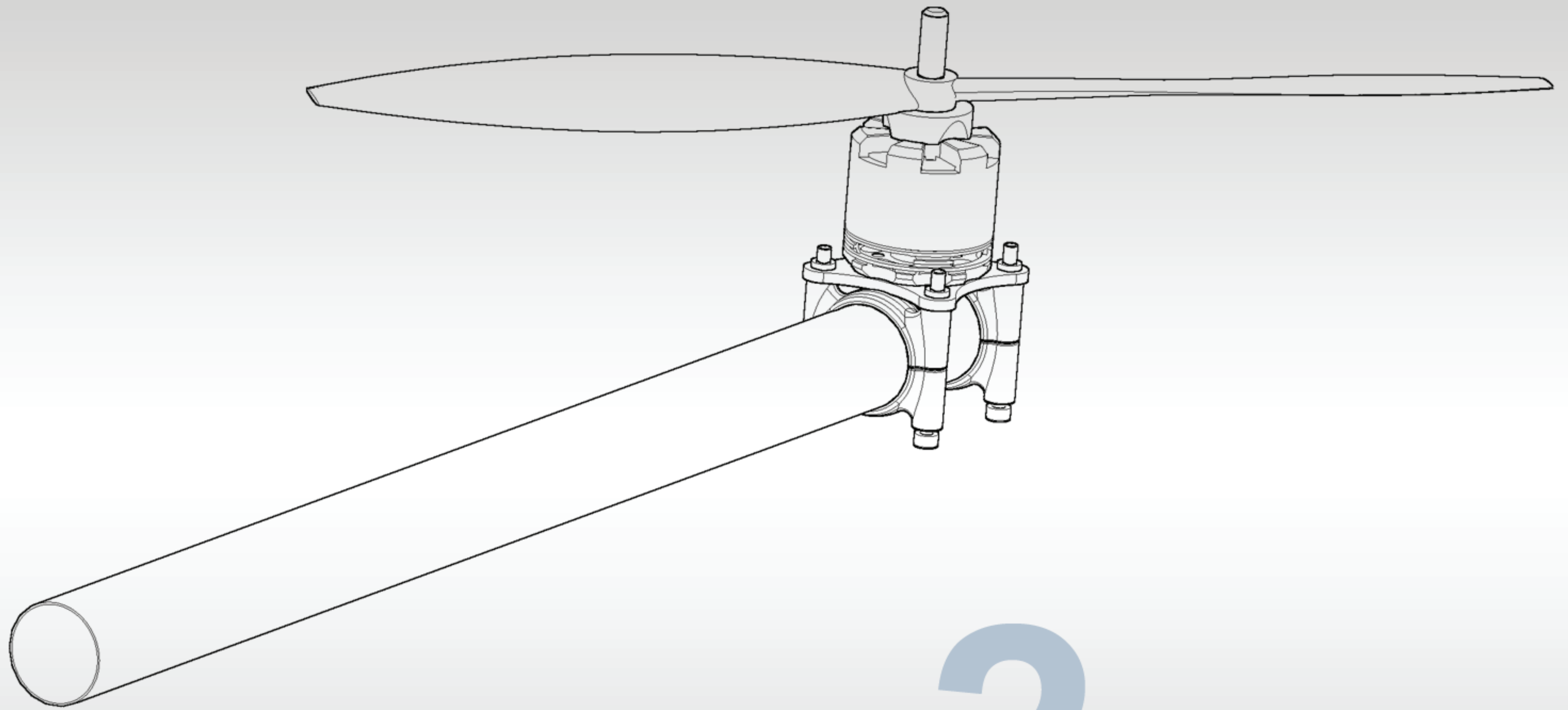


MF1.11 Thread the twenty-four (24) M3x40 screws just far enough, so that they are flush with the edge of the press nut. Do not tighten fully, as we will need the clamps loose in order to insert the booms.

12



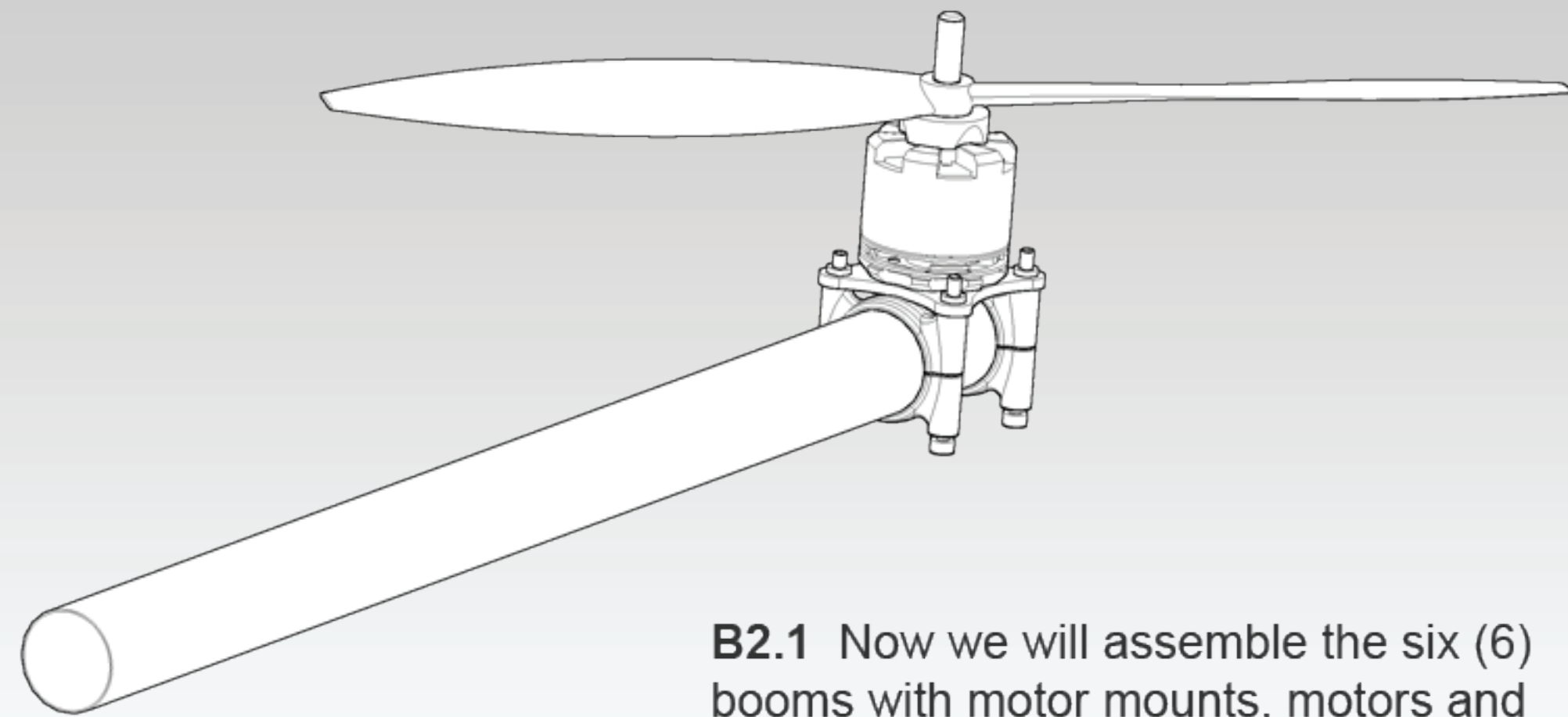
MF1.12 Assembled main frame.



2

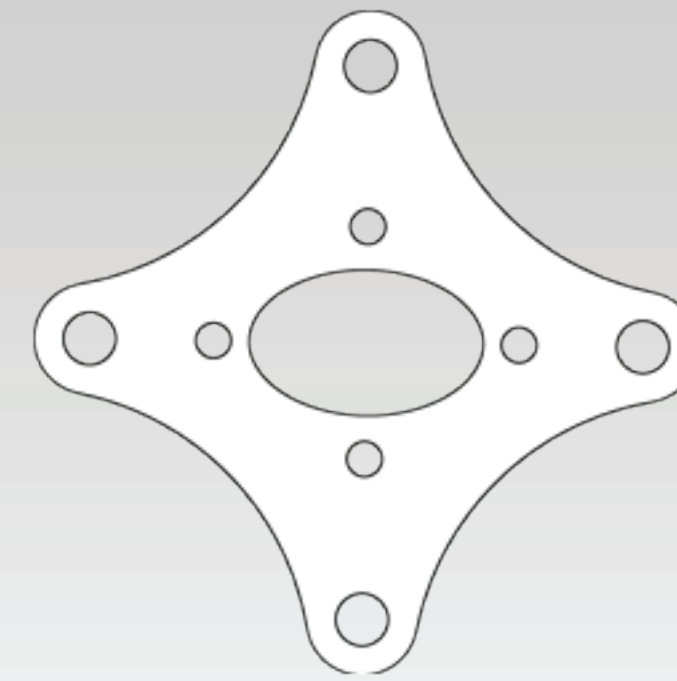
BOOM
B1.1 - B1.14

1



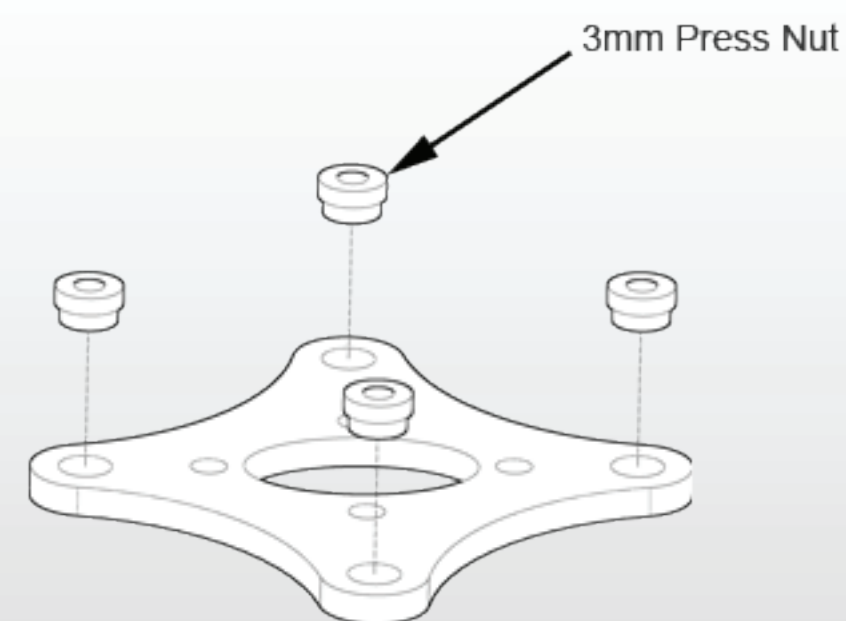
B2.1 Now we will assemble the six (6) booms with motor mounts, motors and props.

2



B2.2 Familiarize yourself with the six (6) motor mount plates. Please note that it will be easier to install the press nuts into the motor mount plates prior to installing the motors.

3



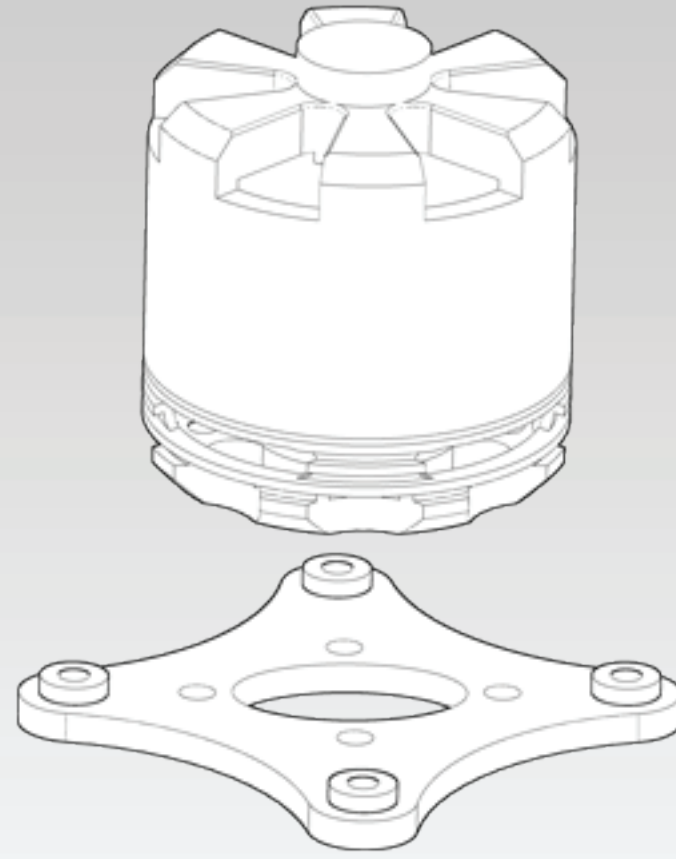
B2.3 Install four (4) 3mm press nuts into the motor mount plate.

4



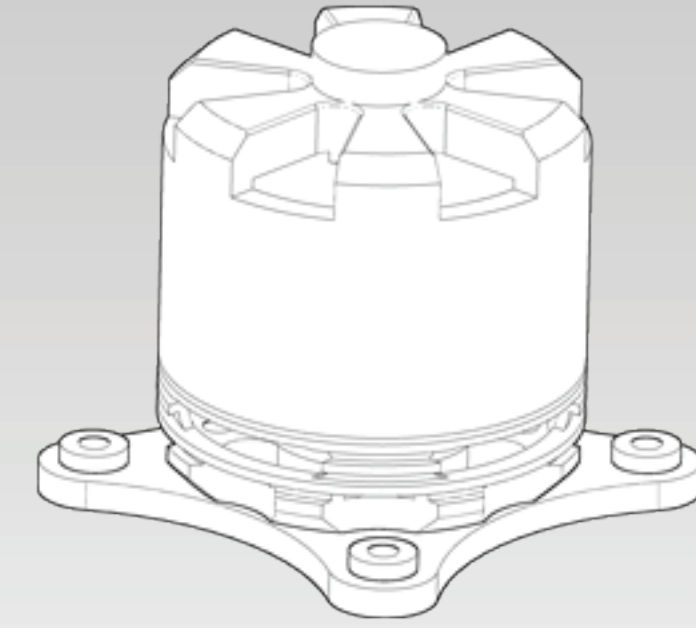
B2.4 3mm press nuts fully seated.

5



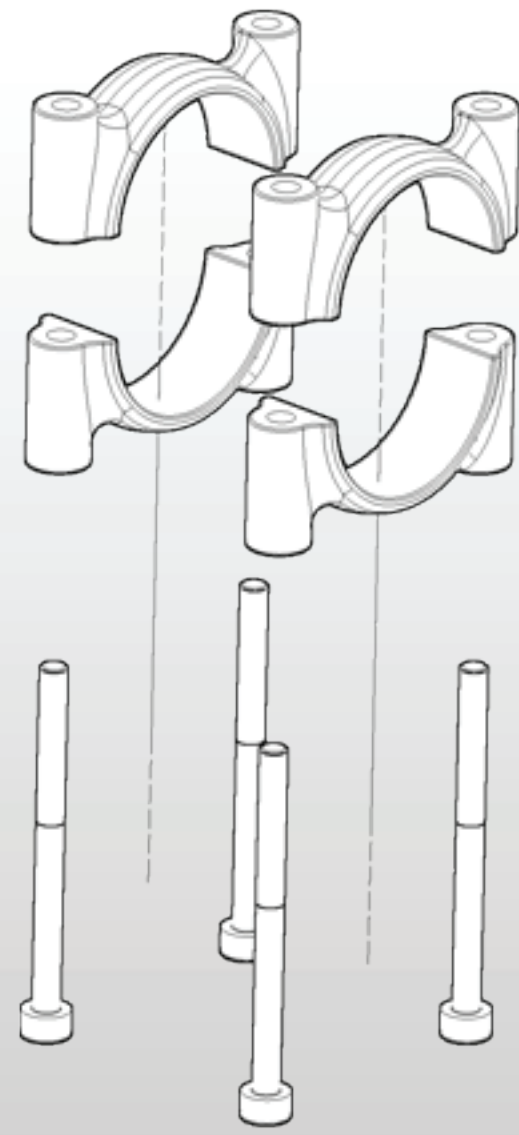
B2.5 Install motors onto the motor mount plate using M3x6 button head cap screws (“BHCS”) making sure to use purple Loctite.

6



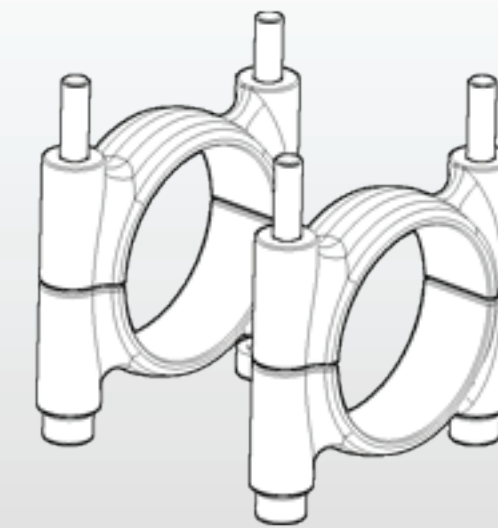
B2.6 Motor mounted to the motor mount plate. Please observe the orientation of the press nuts.

7



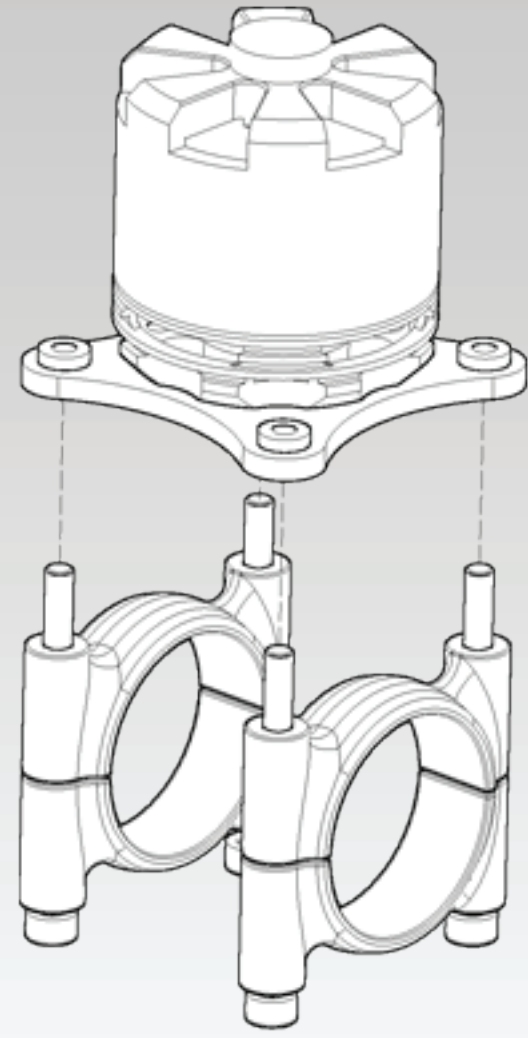
B2.7 Fit the four (4) clamp halves onto the four M3x35 screws.

8



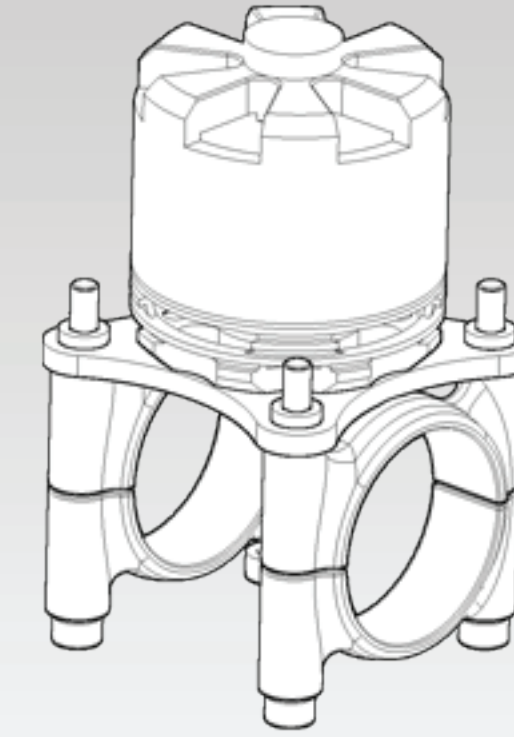
B2.8 Clamps mounted onto the M3x35 screws.

9



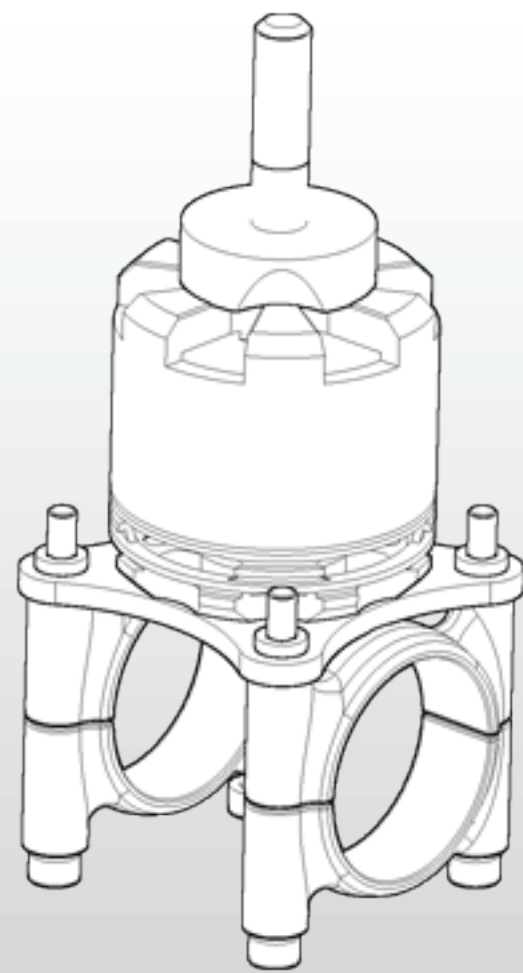
B2.9 Thread the four (4) M3x35 screws into the motor mount plate. Once again, only thread the screws until they are flush with the press nuts, as we will need the slack in the clamps to make the boom installation easier.

10



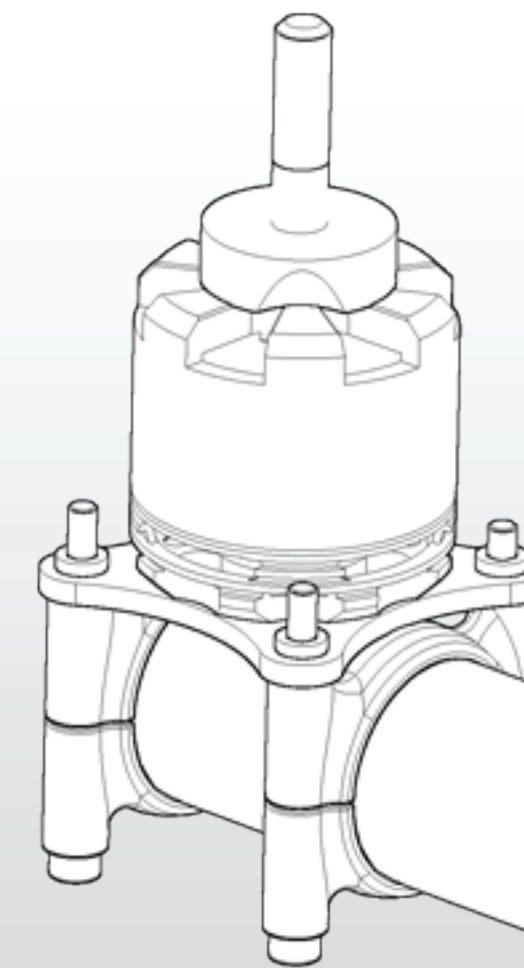
B2.10 Motor and motor mount plate installed.

11



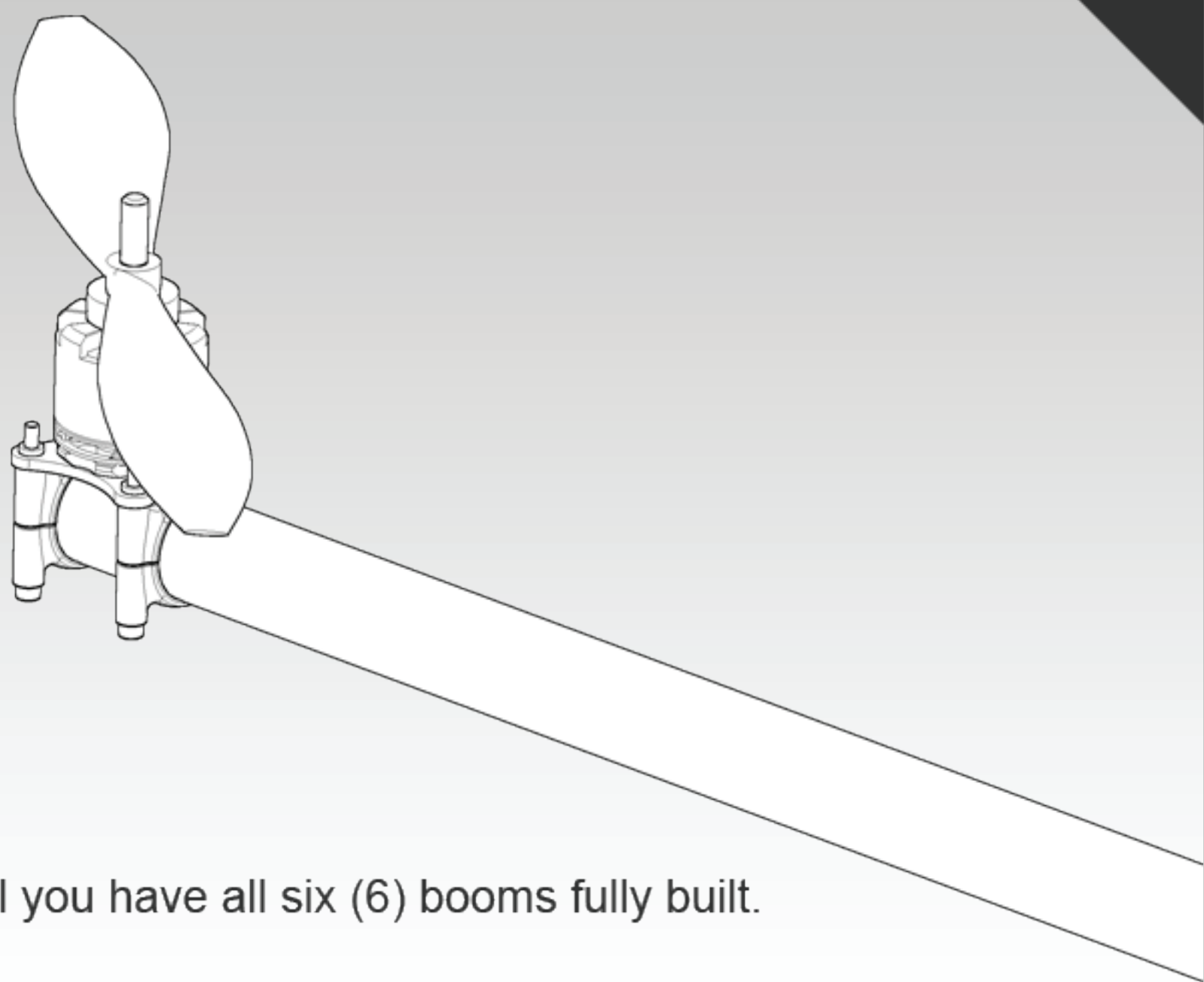
B2.11 Install the included prop adapter onto the Quadrocopter motor.

12

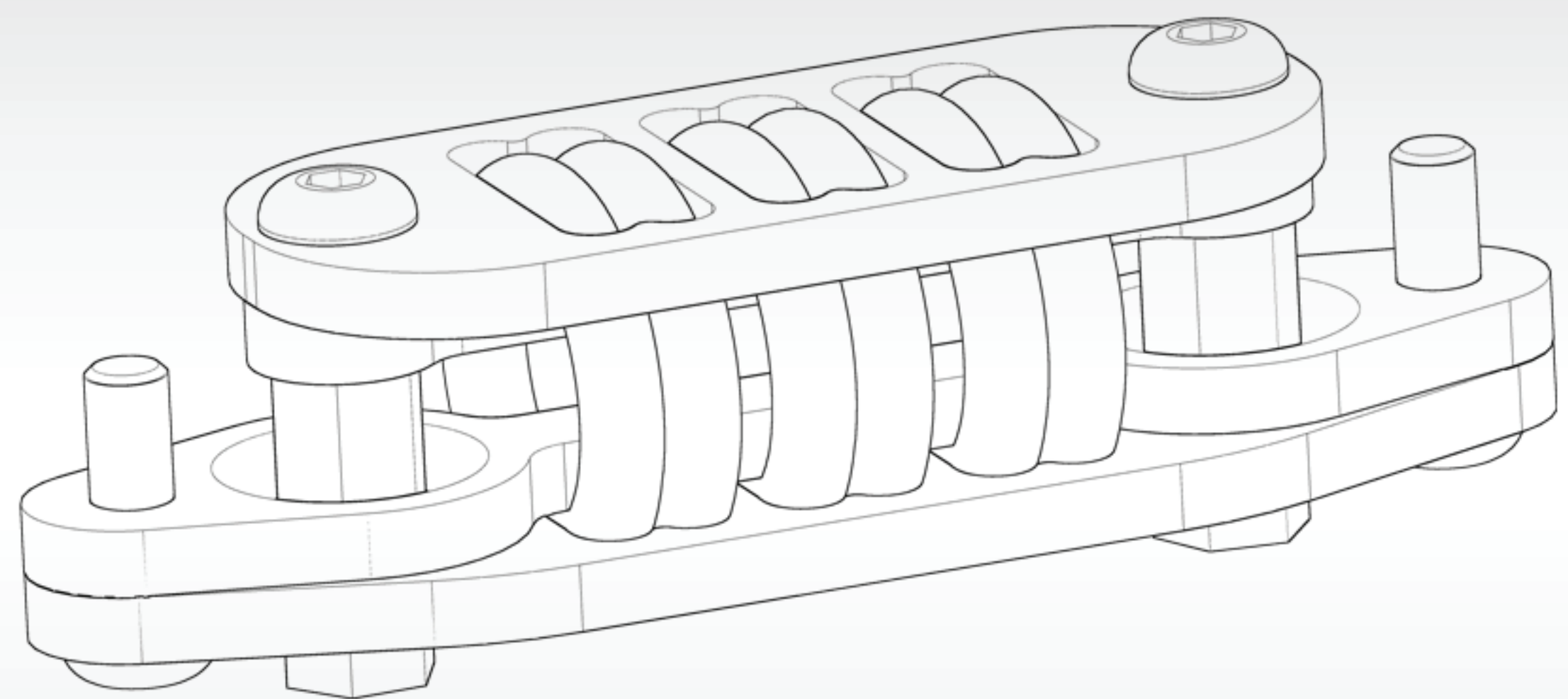


B2.12 Insert the boom into the clamps. It will take a little finessing to get the boom through the clamps, as the parts are designed to fit fairly tight. Please make sure the end of the boom is flush with the end of the clamp. Tighten the M3x35 screws to secure the boom.

13

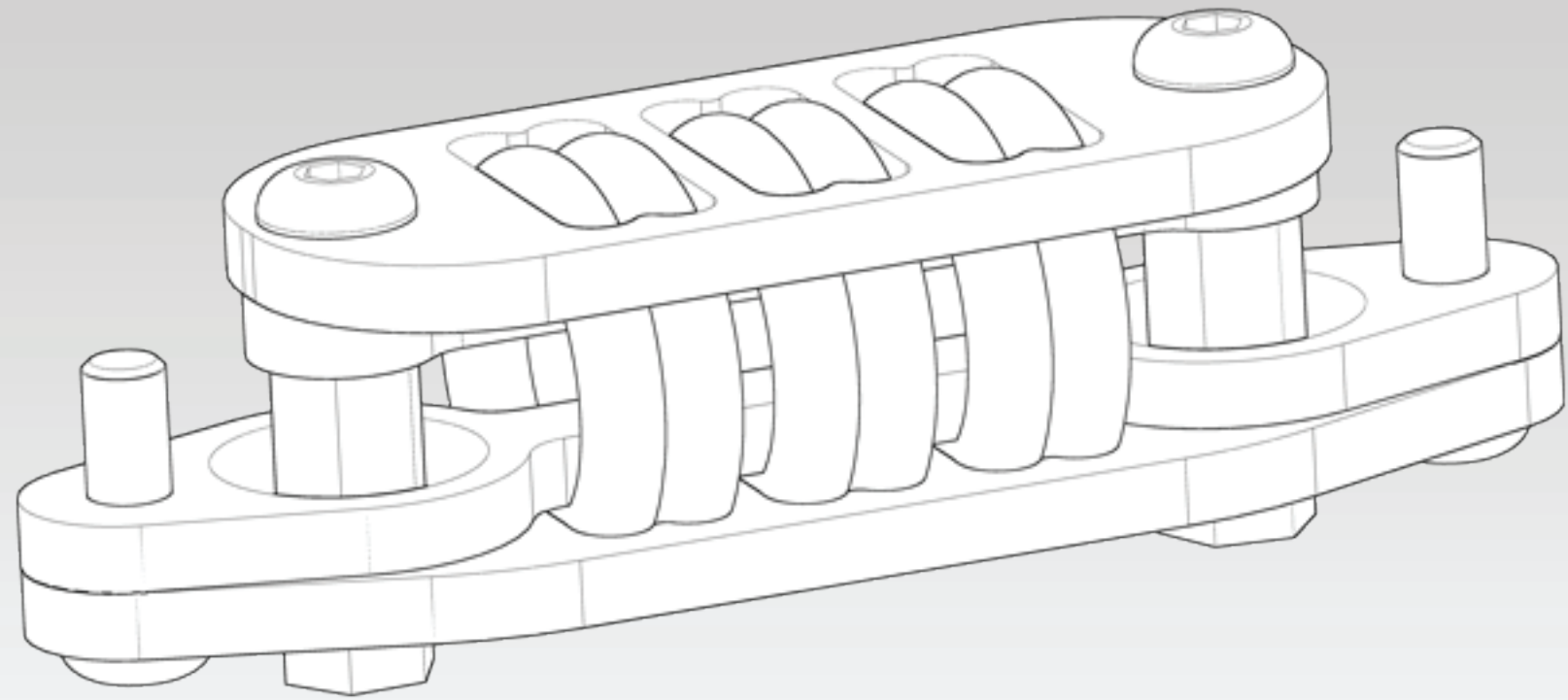


B2.13 Repeat these steps until you have all six (6) booms fully built.



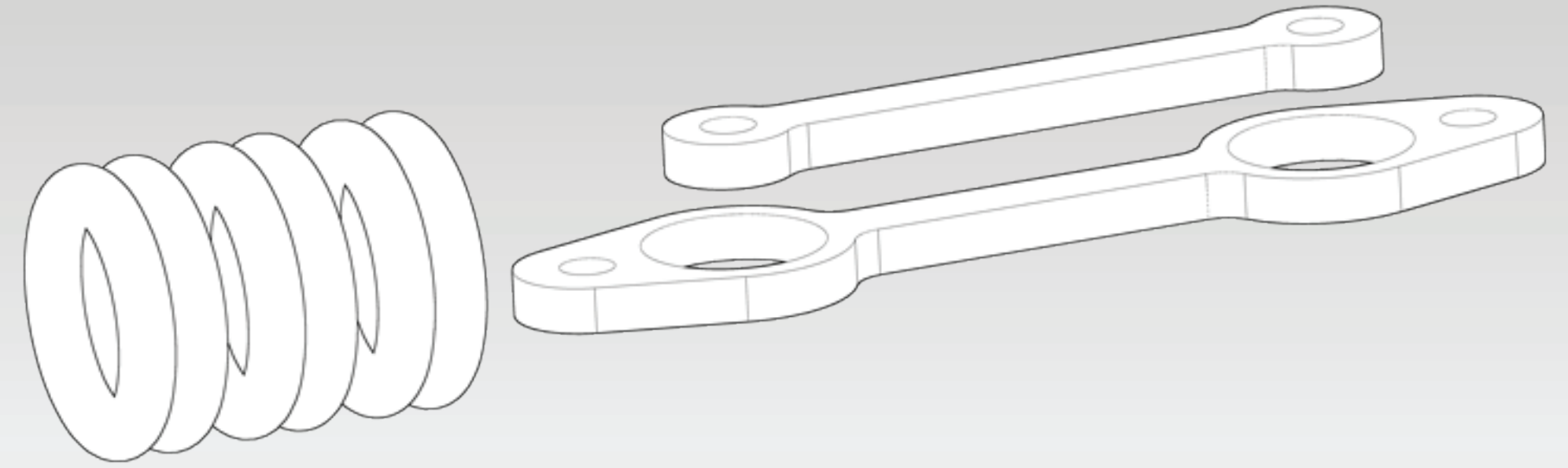
3 ISOLATOR
ISO1.1 - ISO1.12

1



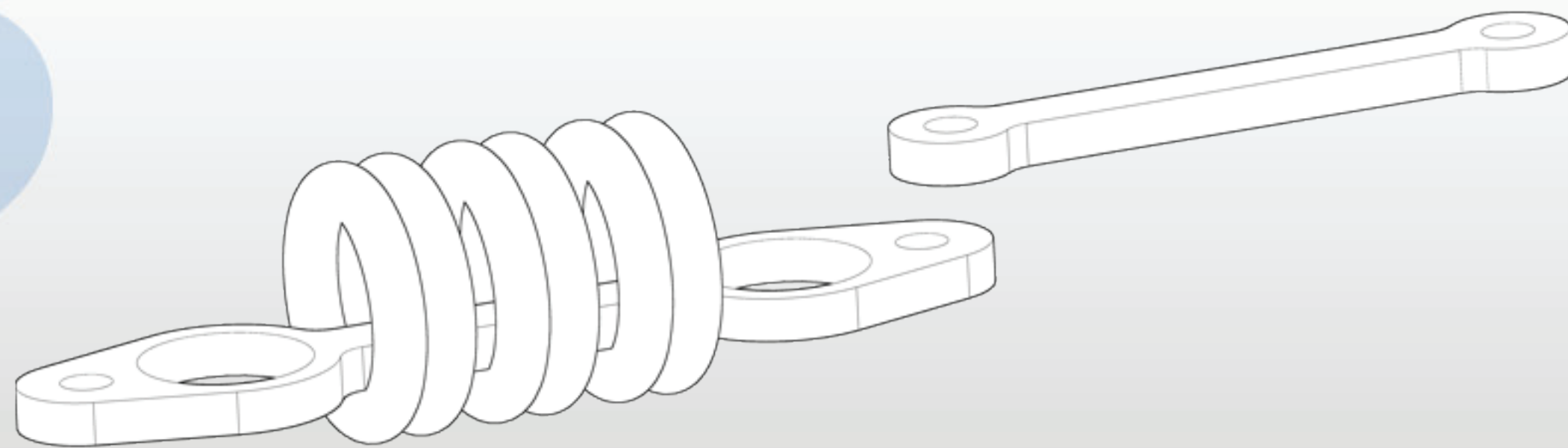
ISO3.1 We will now assemble the three (3) vibration isolators. Shown is the completed vibration isolator.

2



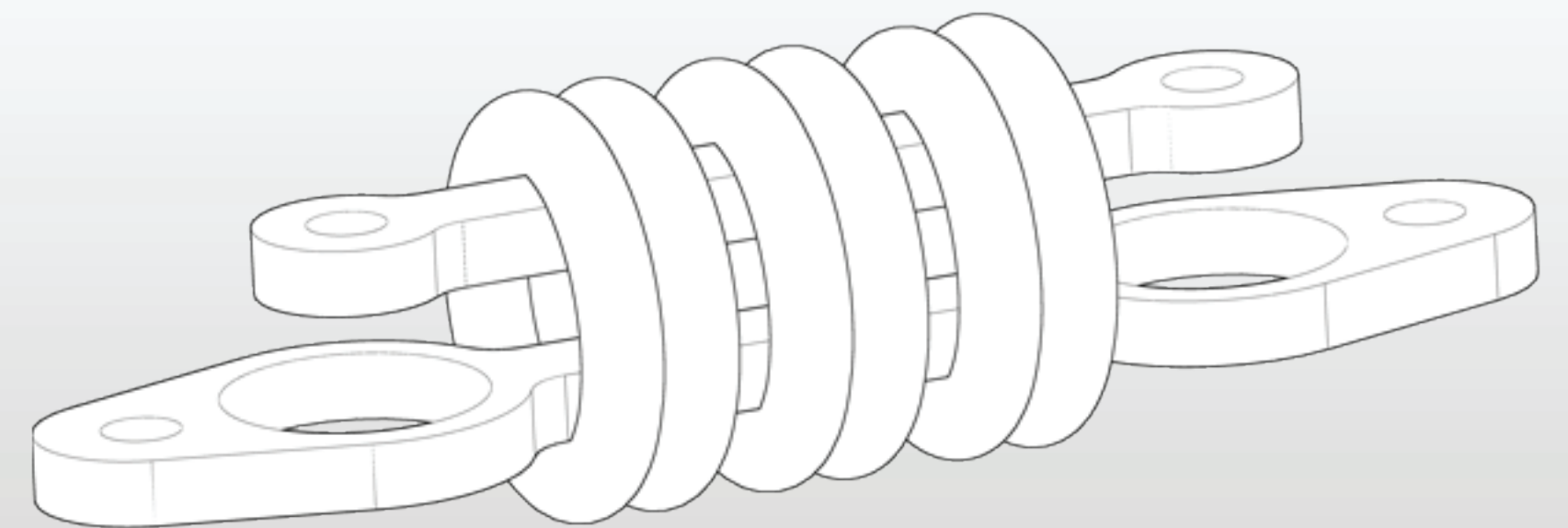
ISO3.2 Find the two (2) O-ring clamp plates.

3



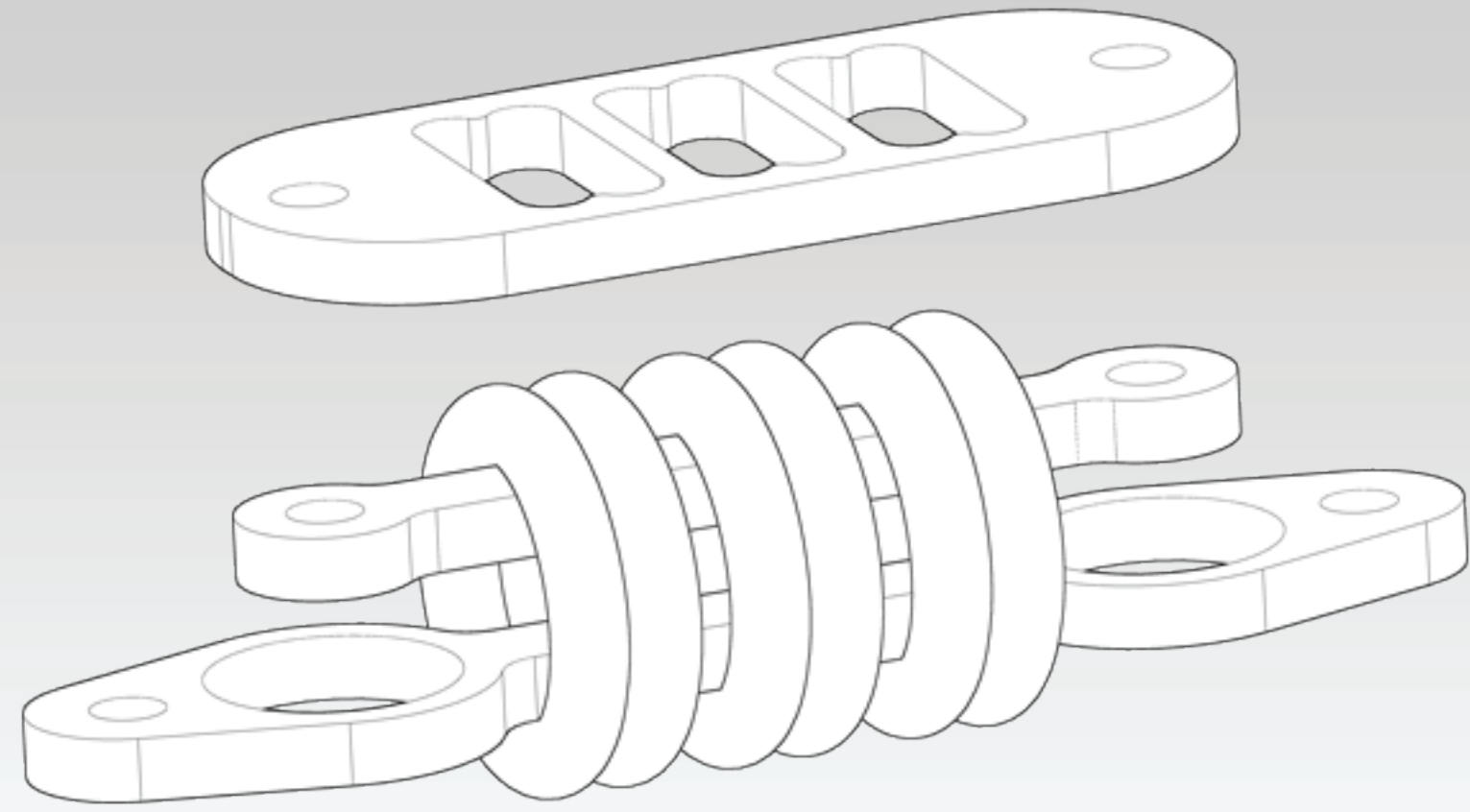
ISO3.3 Insert the bottom clamp plate through the six (6) silicone O-rings.

4



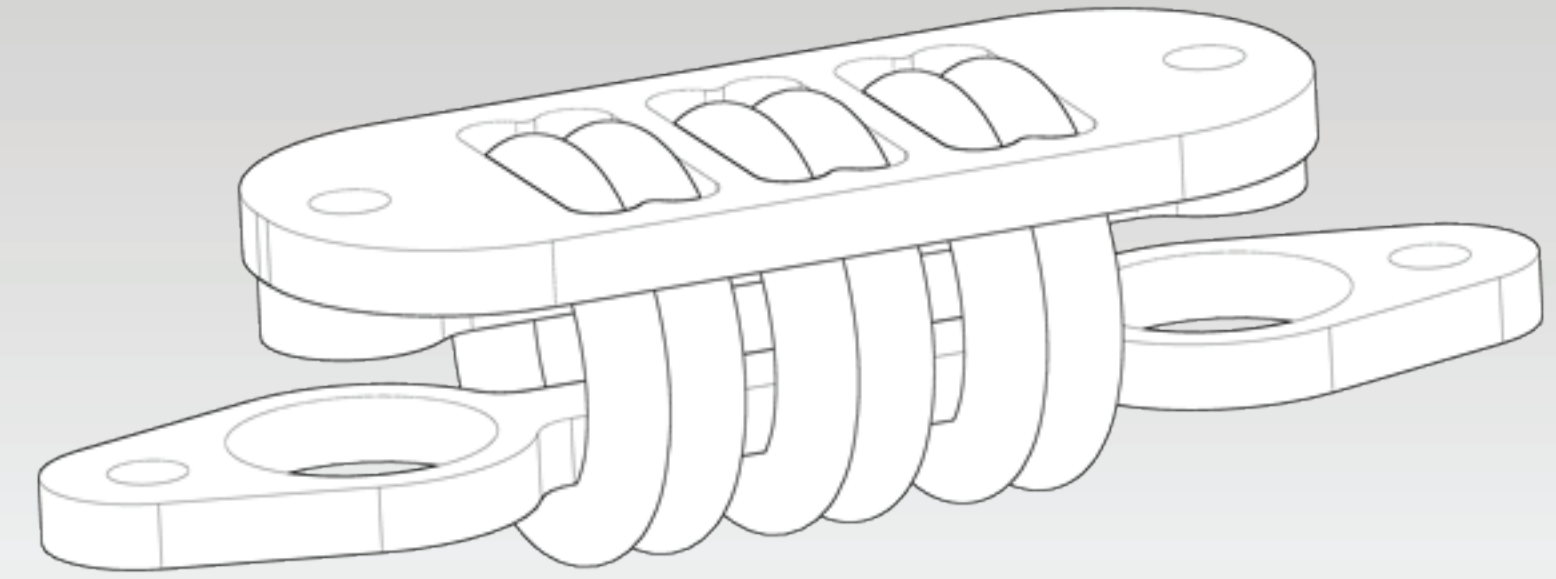
ISO3.4 Insert the top clamp plate through the six (6) silicone O-rings.

5



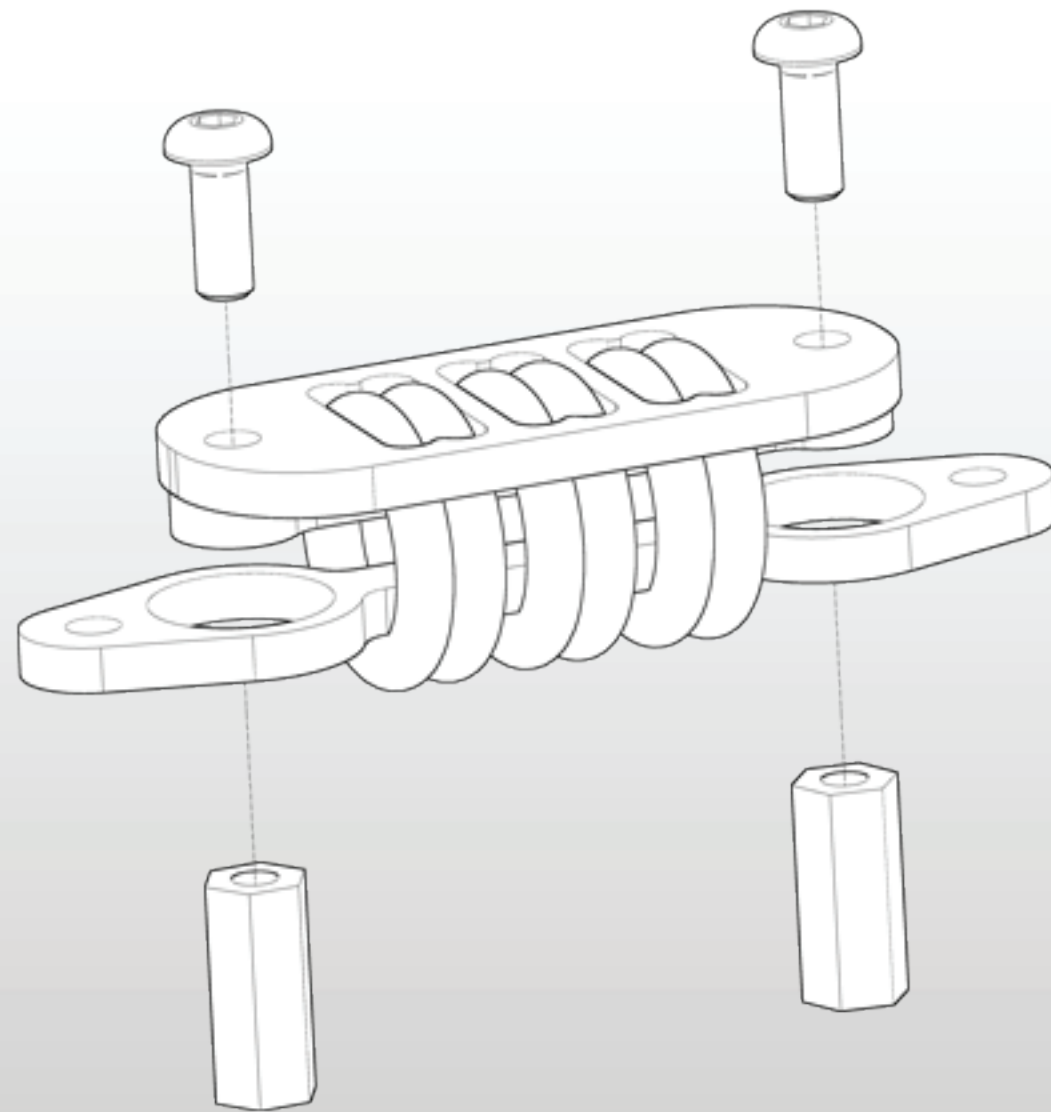
ISO3.5 Place the top isolator plate on top of the O-rings. You will need to align pairs of O-rings into the three (3) slots.

6



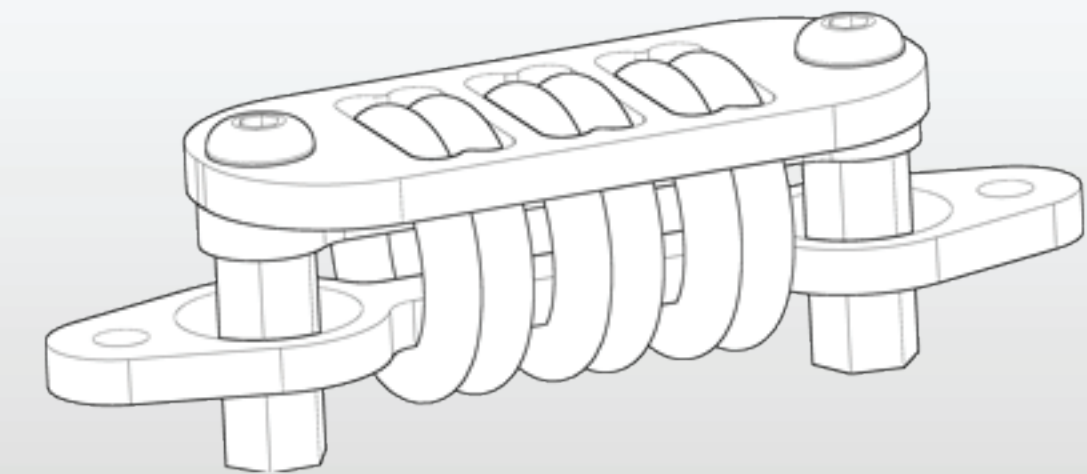
ISO3.6 Top isolator plate installed.

7



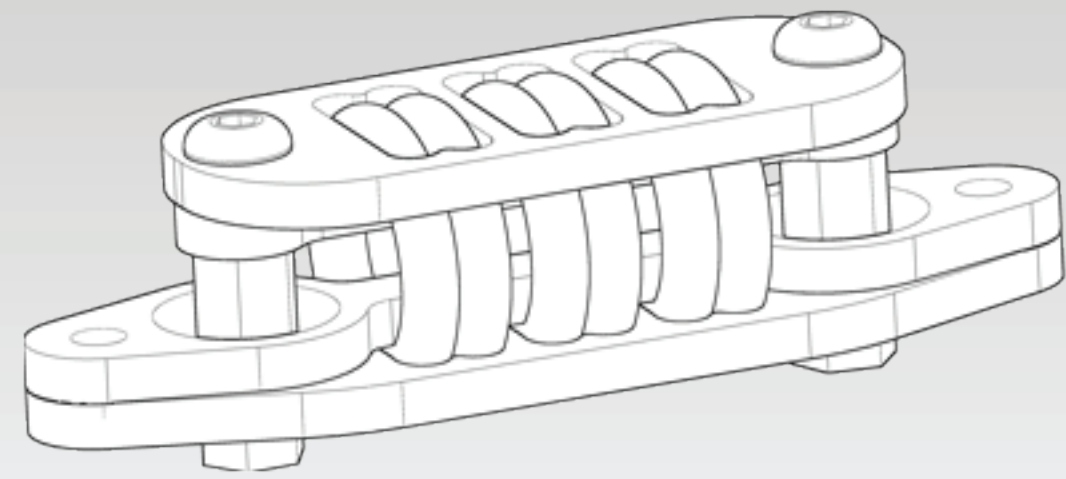
ISO3.7 Install the 12mm aluminum standoffs using M3x8 BHCS.

8



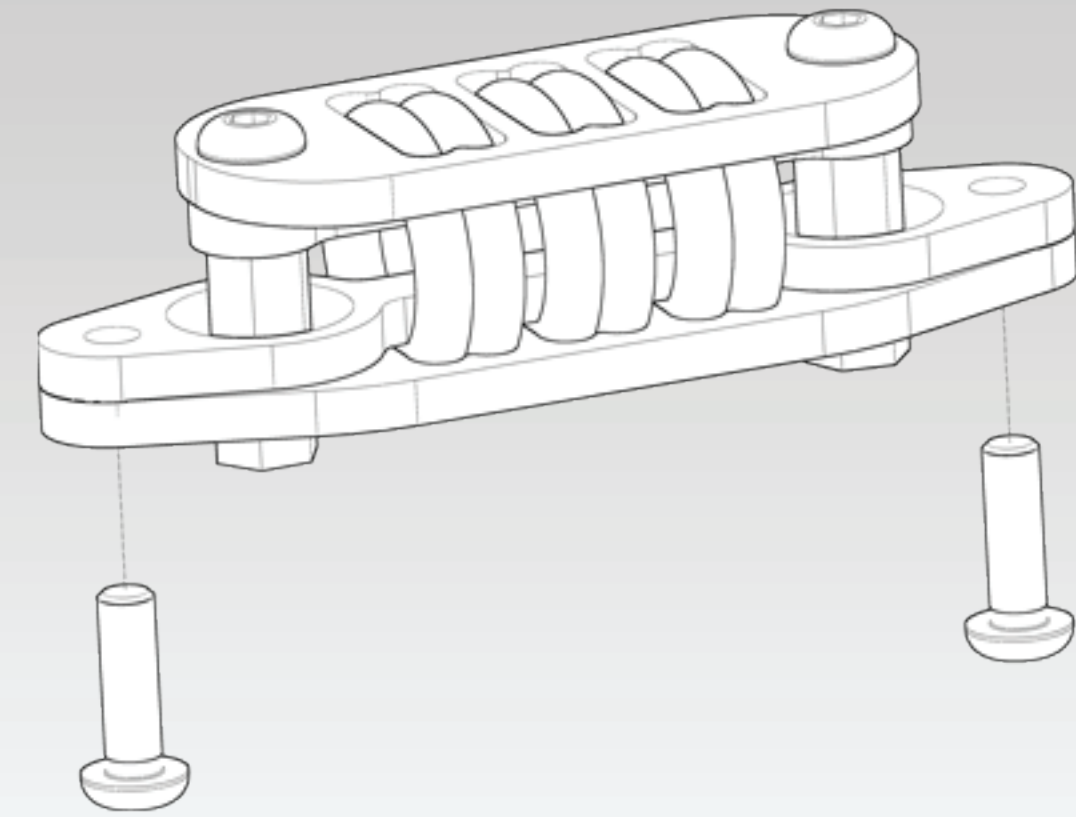
ISO3.8 12mm aluminum standoffs installed.

9



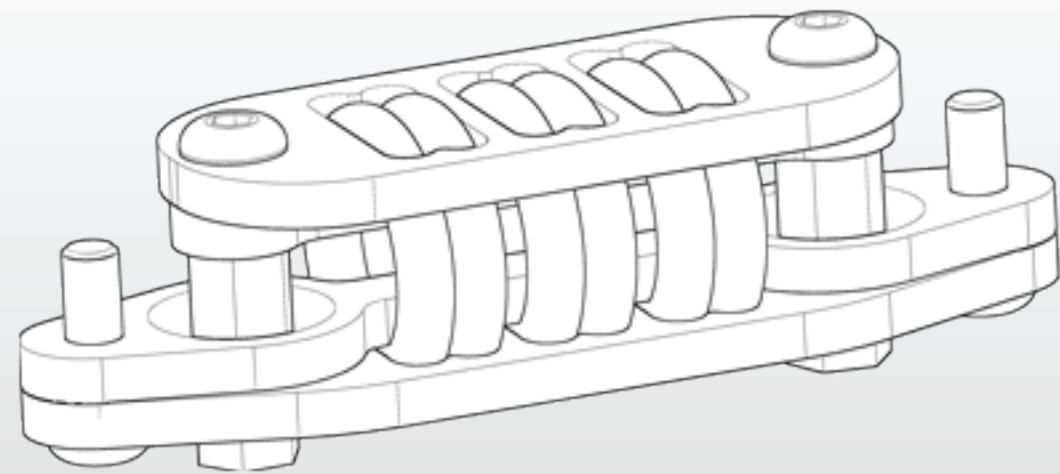
ISO3.9 Install the bottom isolator plate.

10



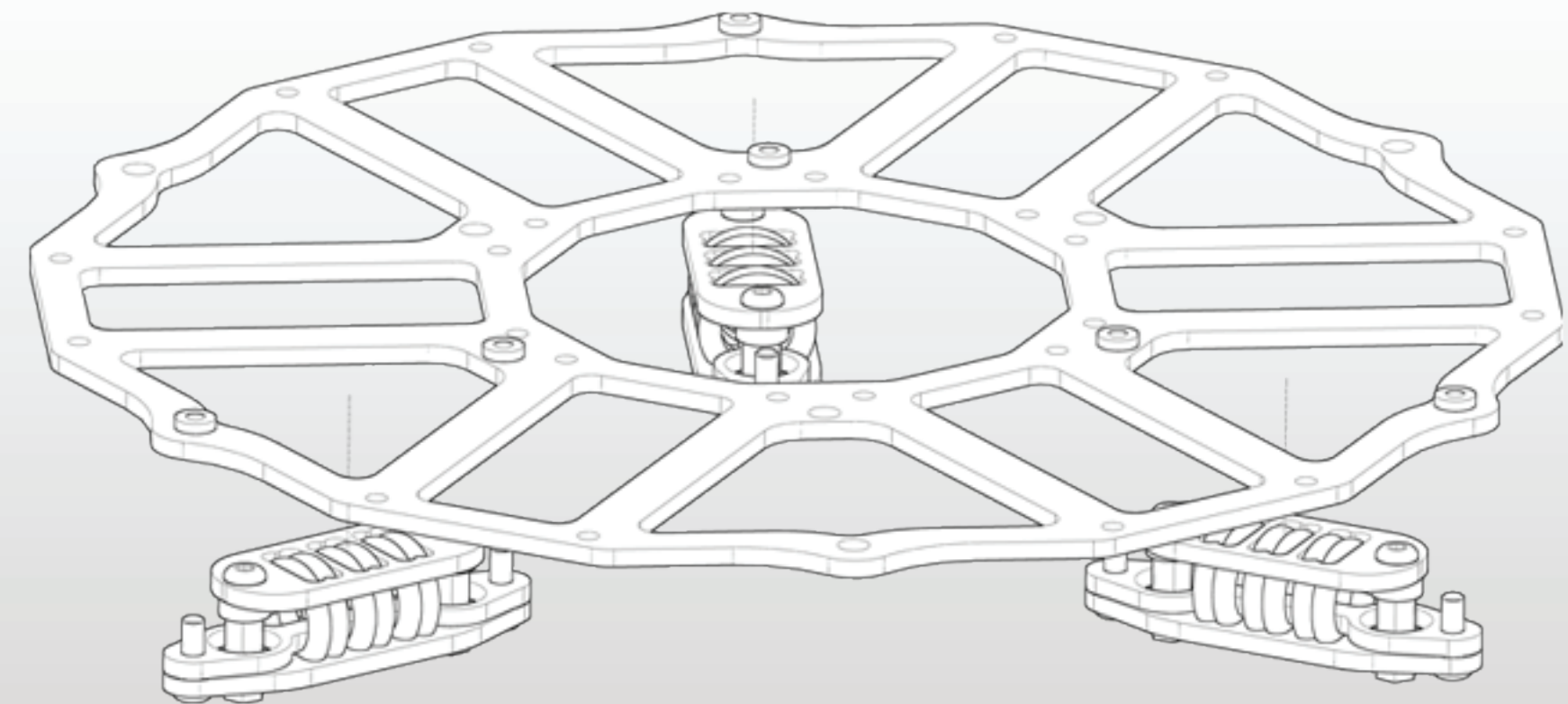
ISO3.10 Insert the M3x10 BHCS. Please note that the screws used here are M3x10 BHCS and the screws used earlier in the isolator are M3x8 BHCS.

11

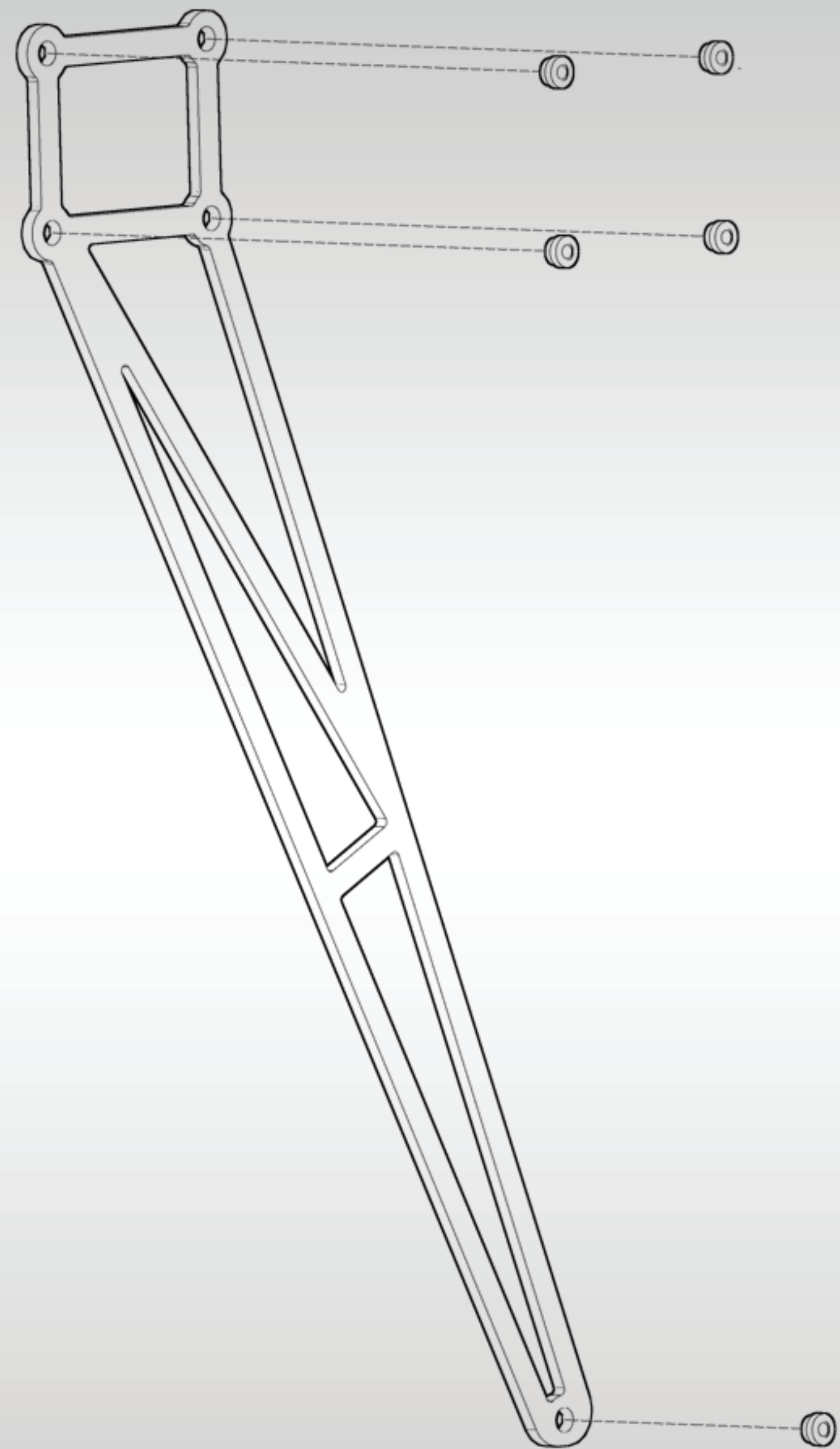


ISO3.11 M3x10 BHCS installed.

12



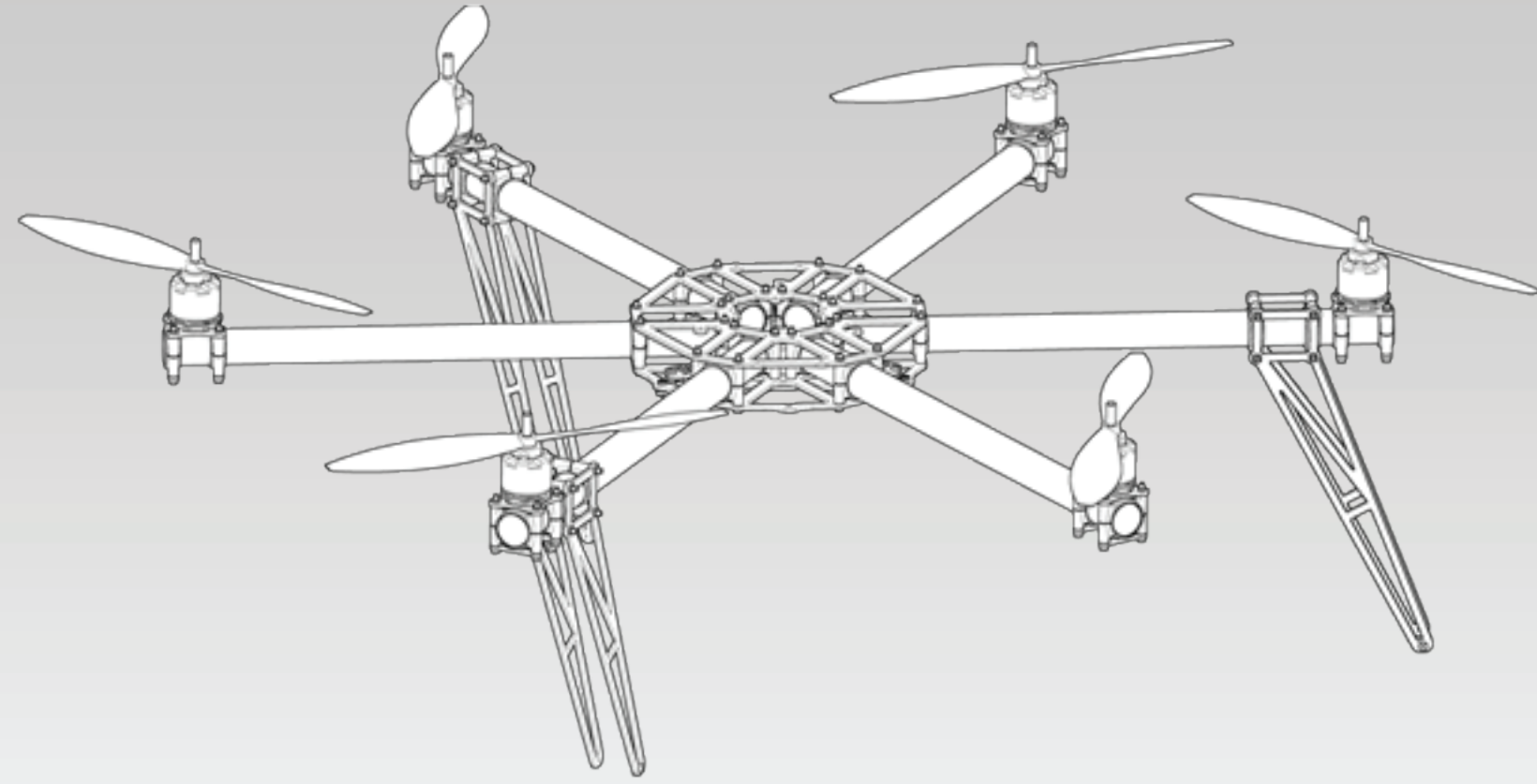
ISO3.12 Attach the three (3) completed isolators to the bottom side of the bottom frame plate by threading the M3x10 BHCS into the press nuts.



4 LANDING GEAR LEGS

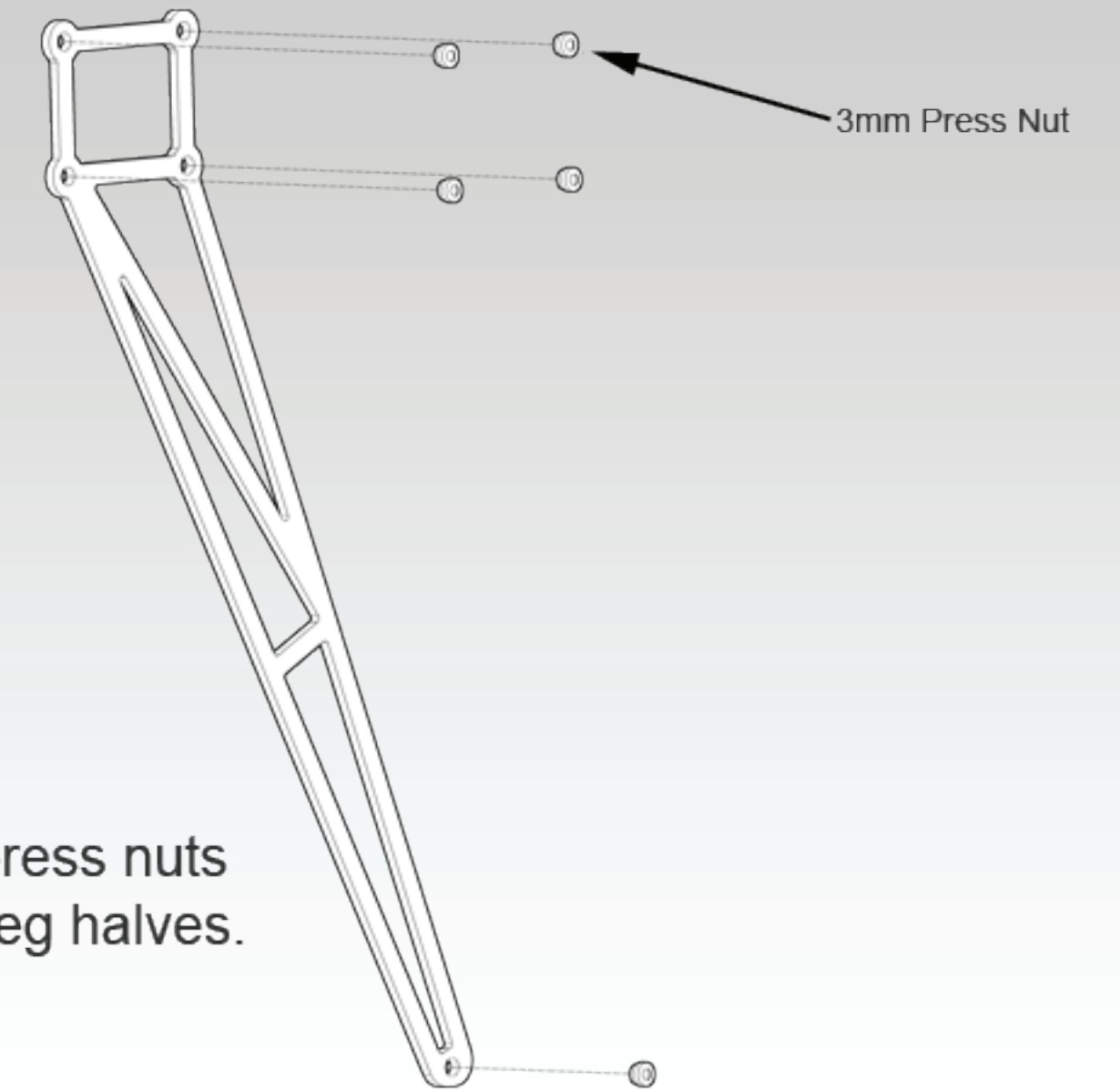
LGL1.1 - LGL1.6

1



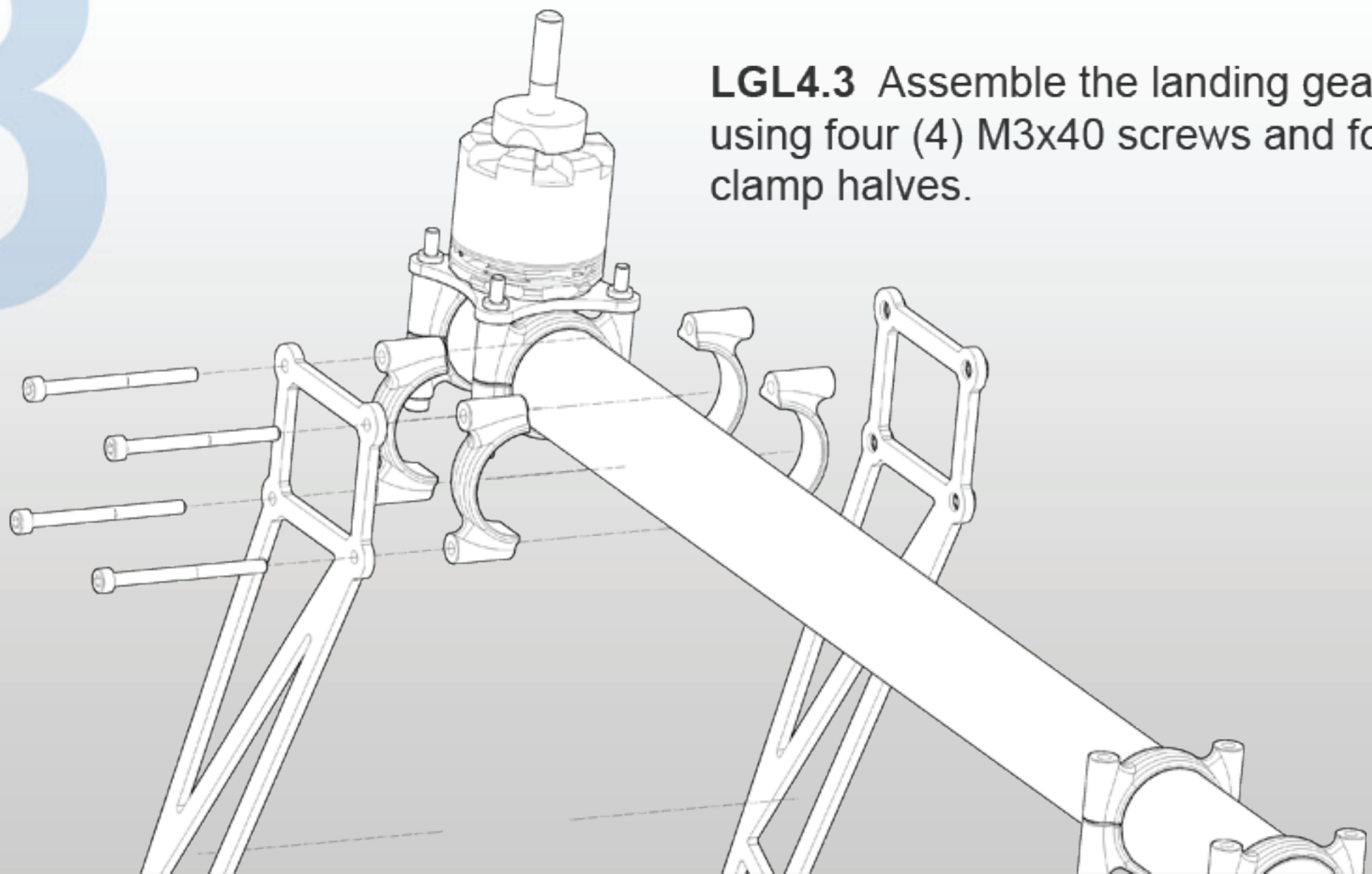
LGL4.1 Now the landing gear needs to be installed. The CineStar team usually runs the rear leg pointed outward and the front two (2) legs pointing inward. The CineStar team sets the landing gear up this way, so that there is the visual cue of the rear leg facing outward while flying. You can also mount the front legs facing outward for maximum stability on takeoff and landing.

2



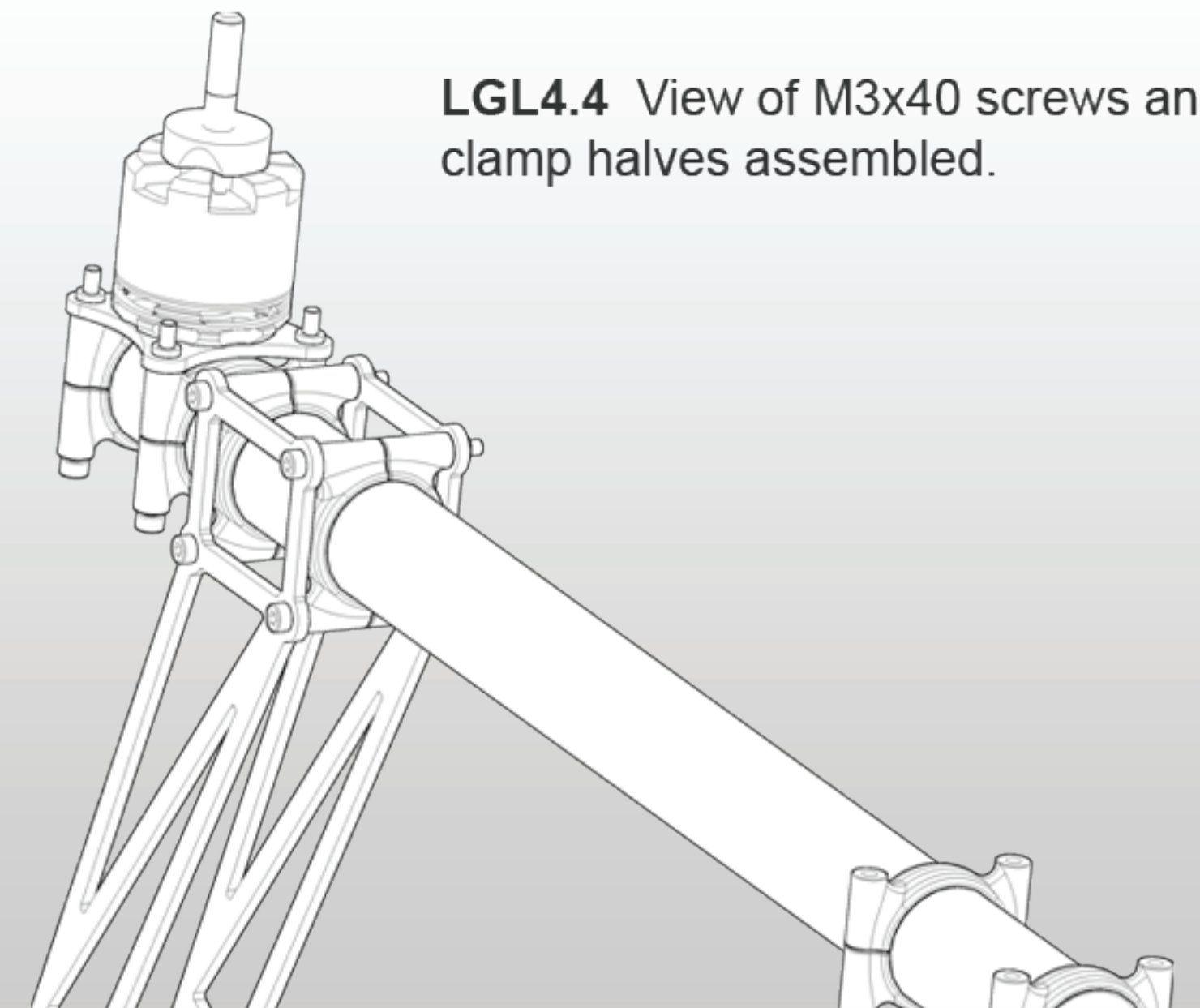
LGL4.2 Install the five (5) 3mm press nuts into three (3) of the landing gear leg halves.

3



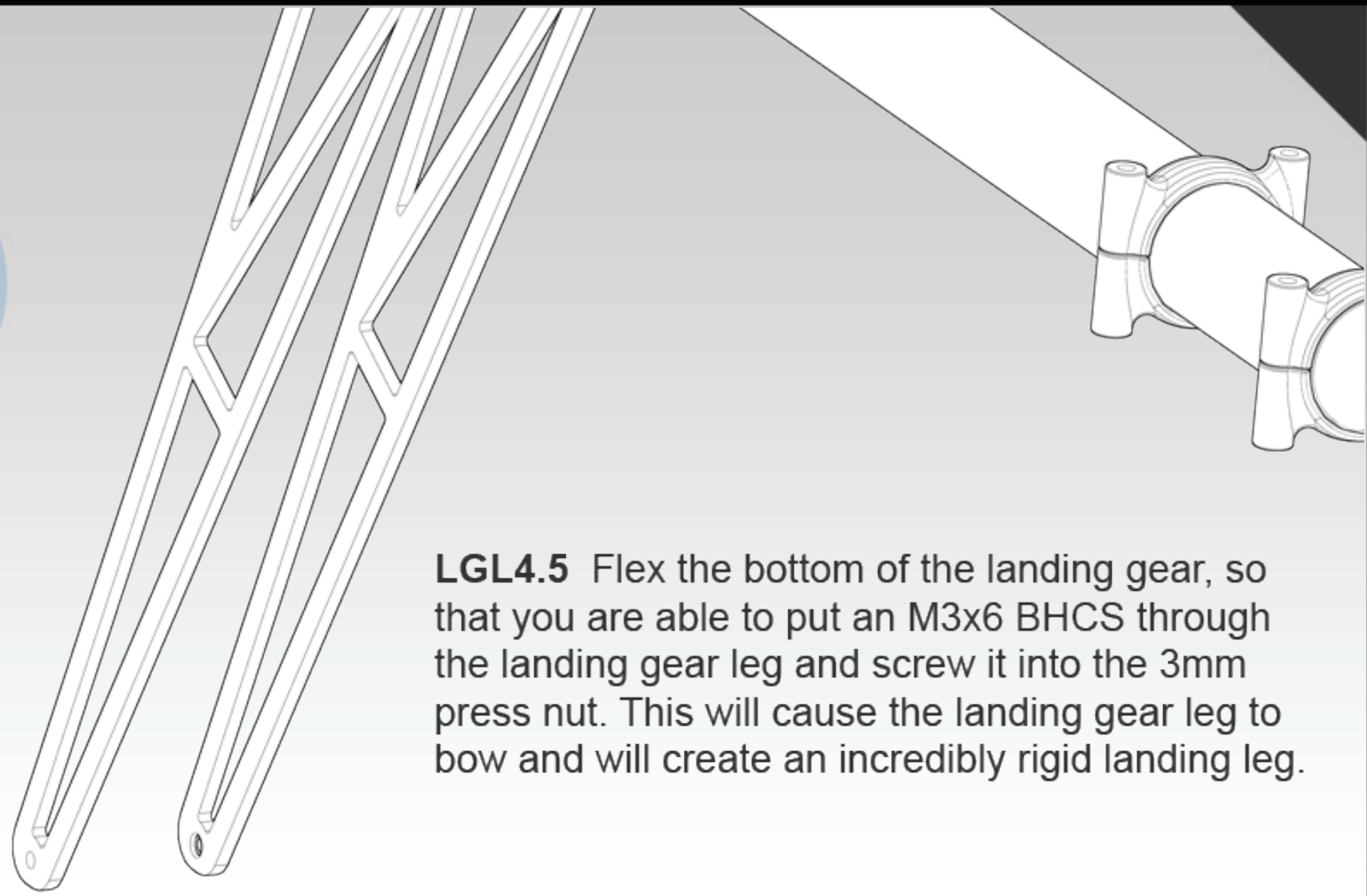
LGL4.3 Assemble the landing gear leg using four (4) M3x40 screws and four (4) clamp halves.

4



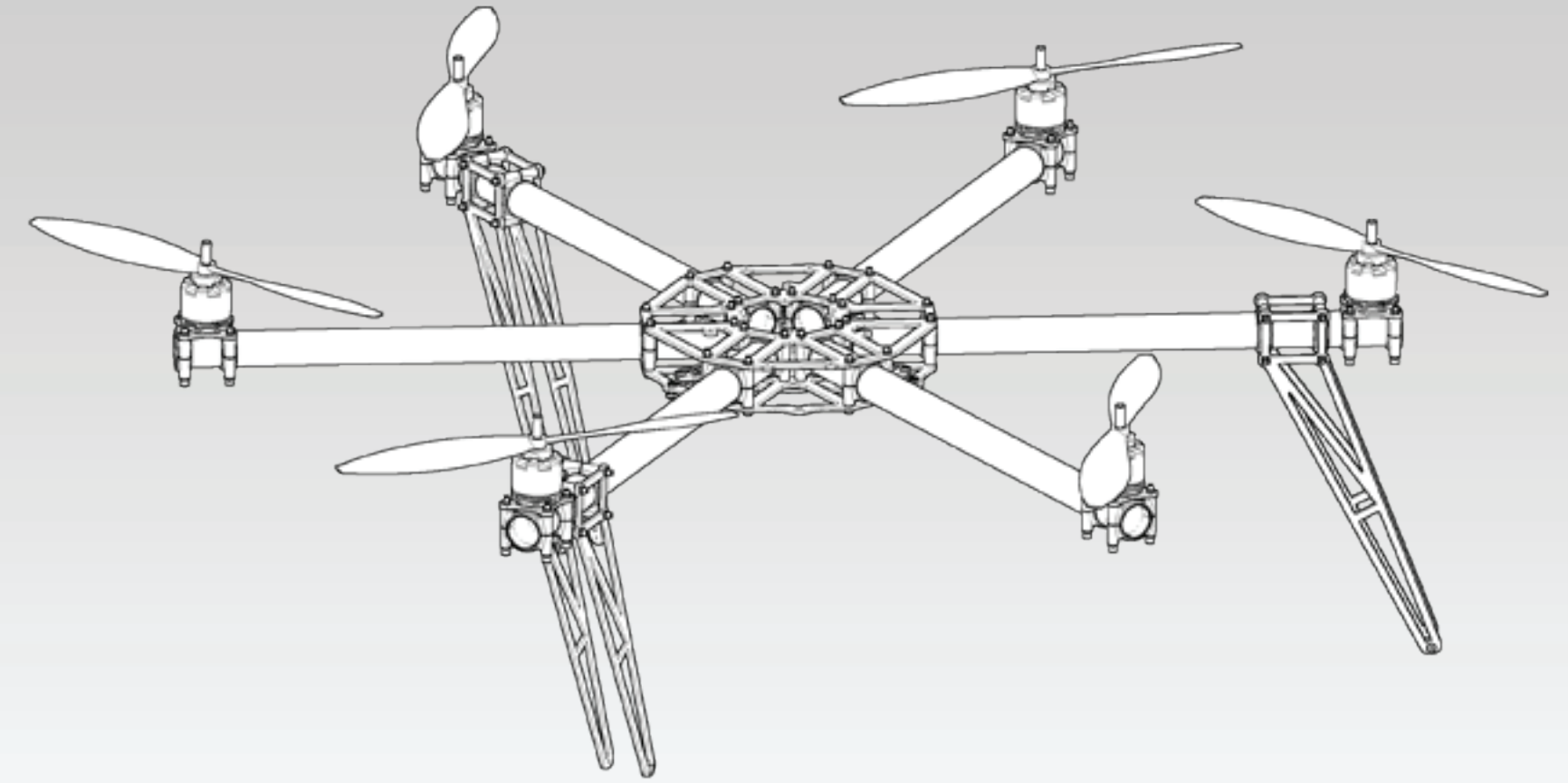
LGL4.4 View of M3x40 screws and clamp halves assembled.

5

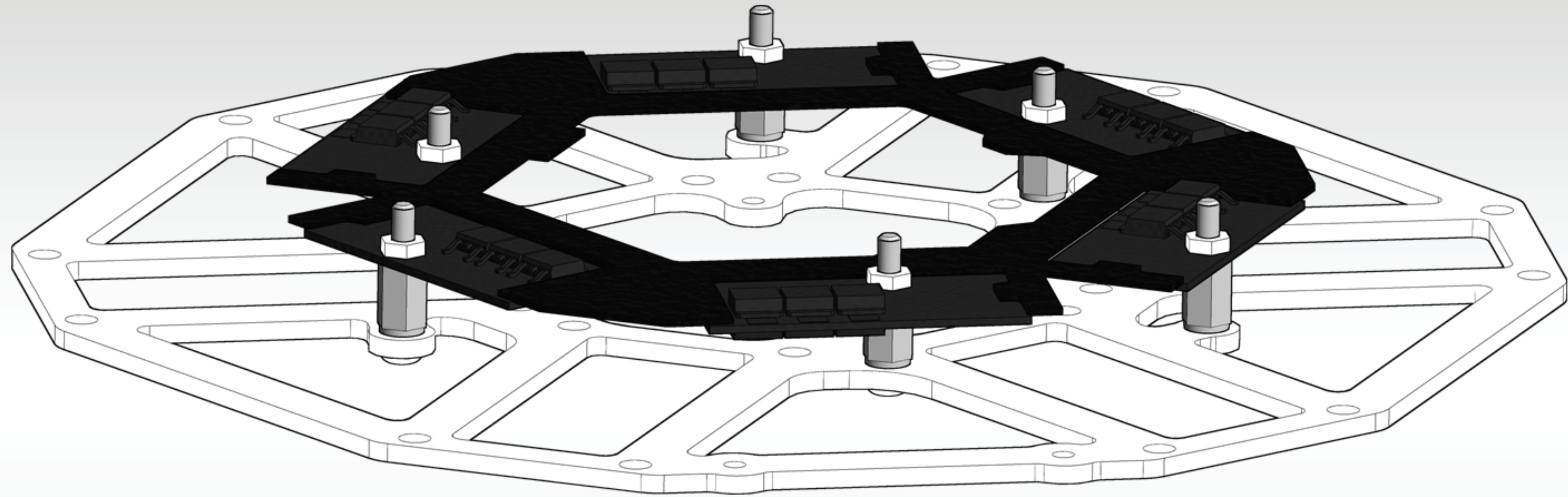


LGL4.5 Flex the bottom of the landing gear, so that you are able to put an M3x6 BHCS through the landing gear leg and screw it into the 3mm press nut. This will cause the landing gear leg to bow and will create an incredibly rigid landing leg.

6



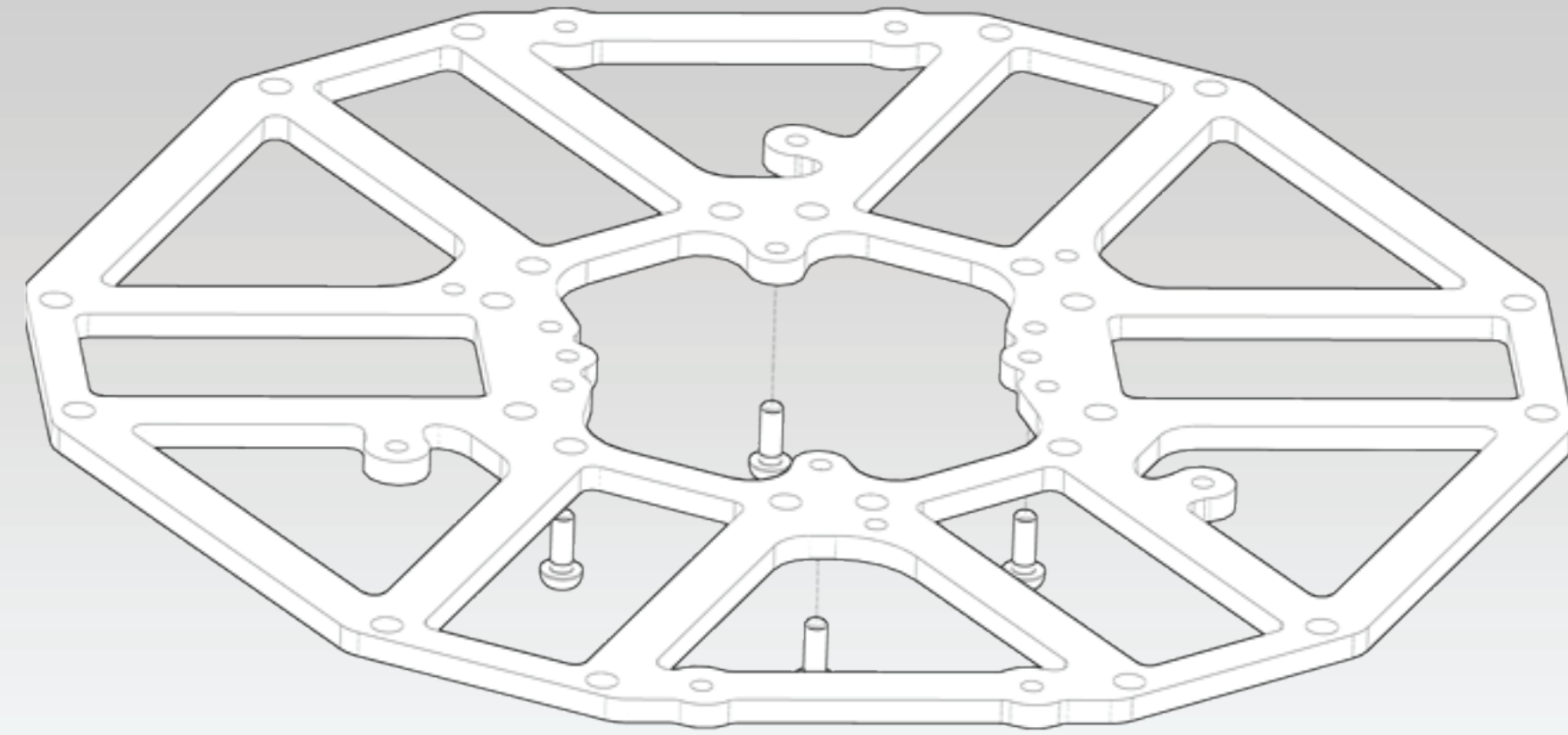
LGL4.6 Complete installation of the remaining two (2) landing gear legs.



5

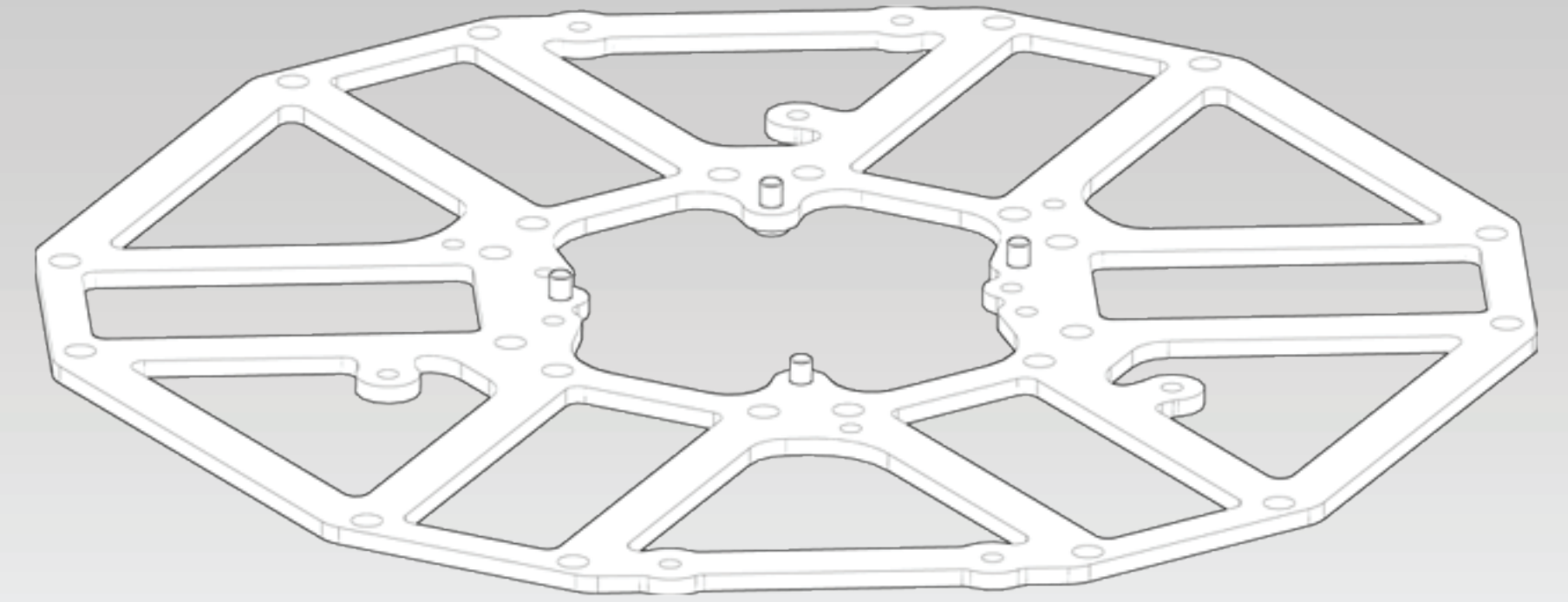
MK ELECTRONICS
MKE1.1 - MKE1.13

1



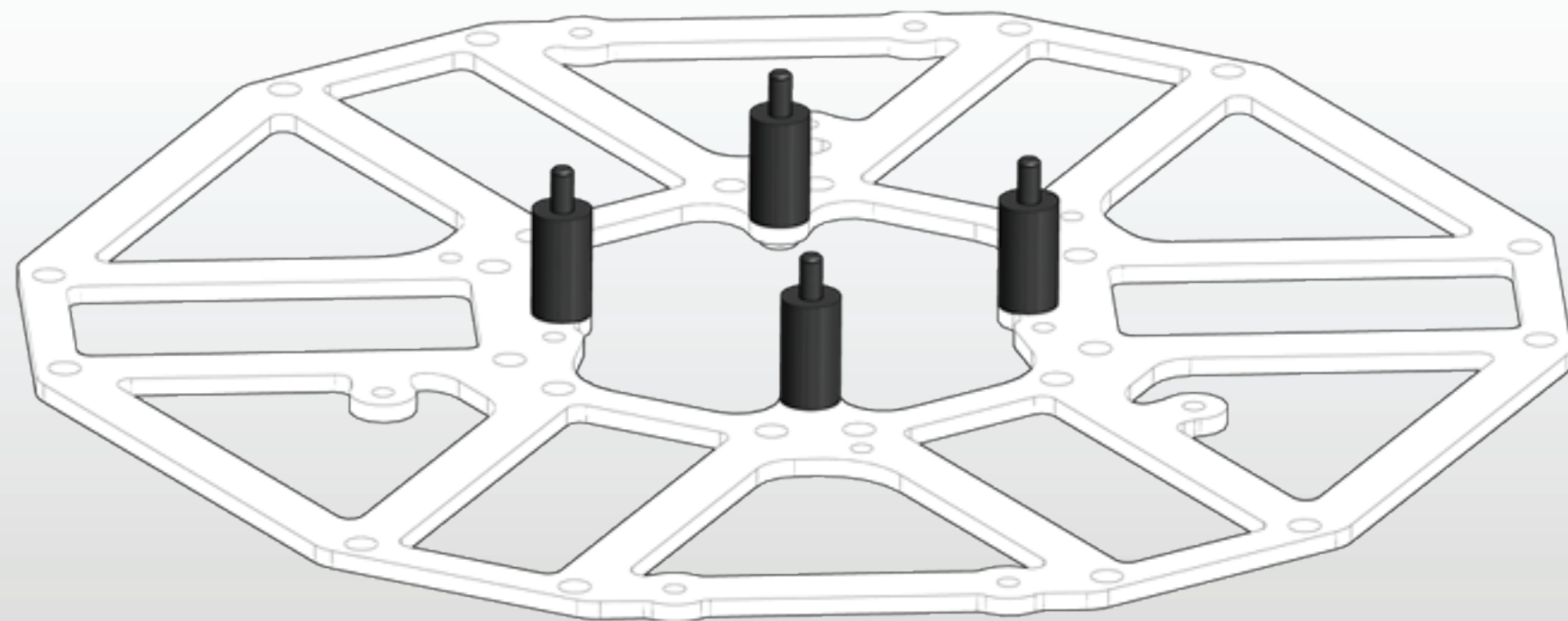
MKE5.1 Insert four (4) M3x6 BHCS to hold the flight control board vibration isolators. Note only the top frame plate is shown for ease of illustration.

2



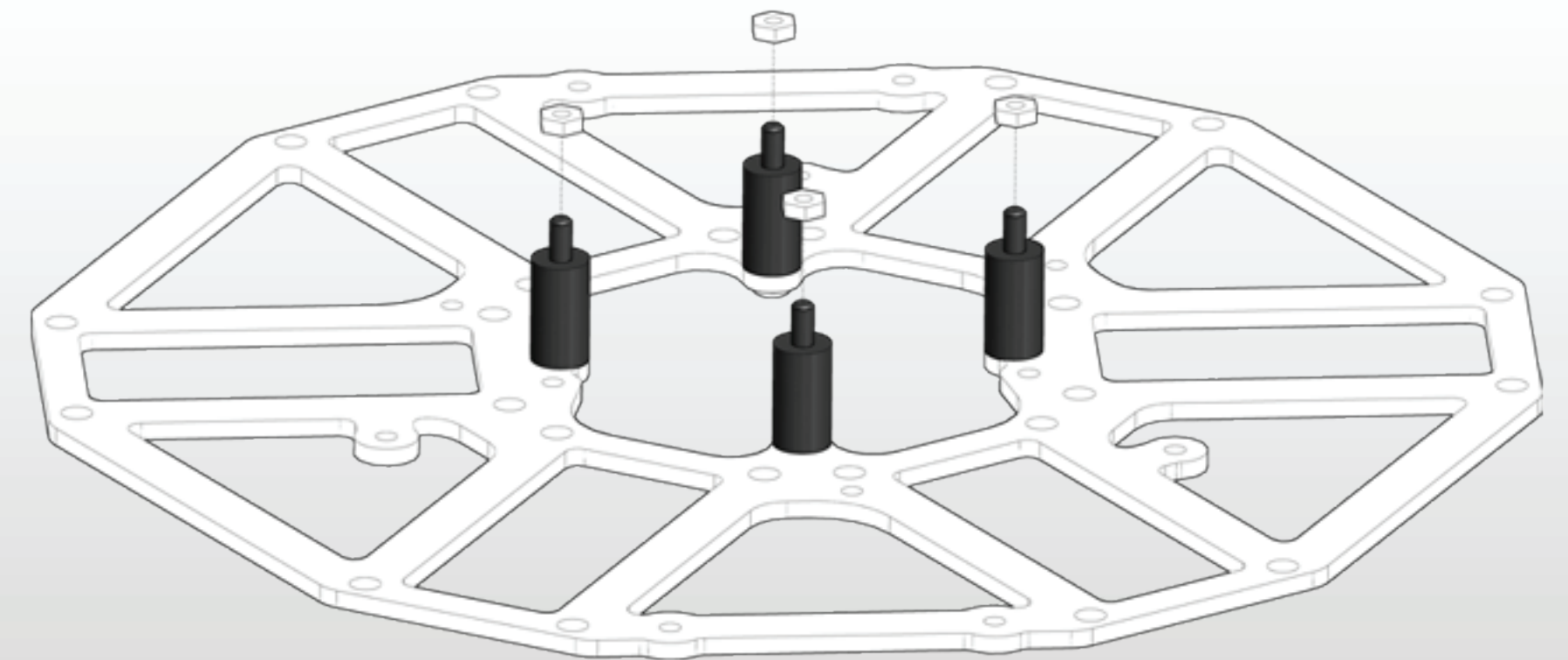
MKE5.2 View of four (4) M3x6 BHCS installed.

3



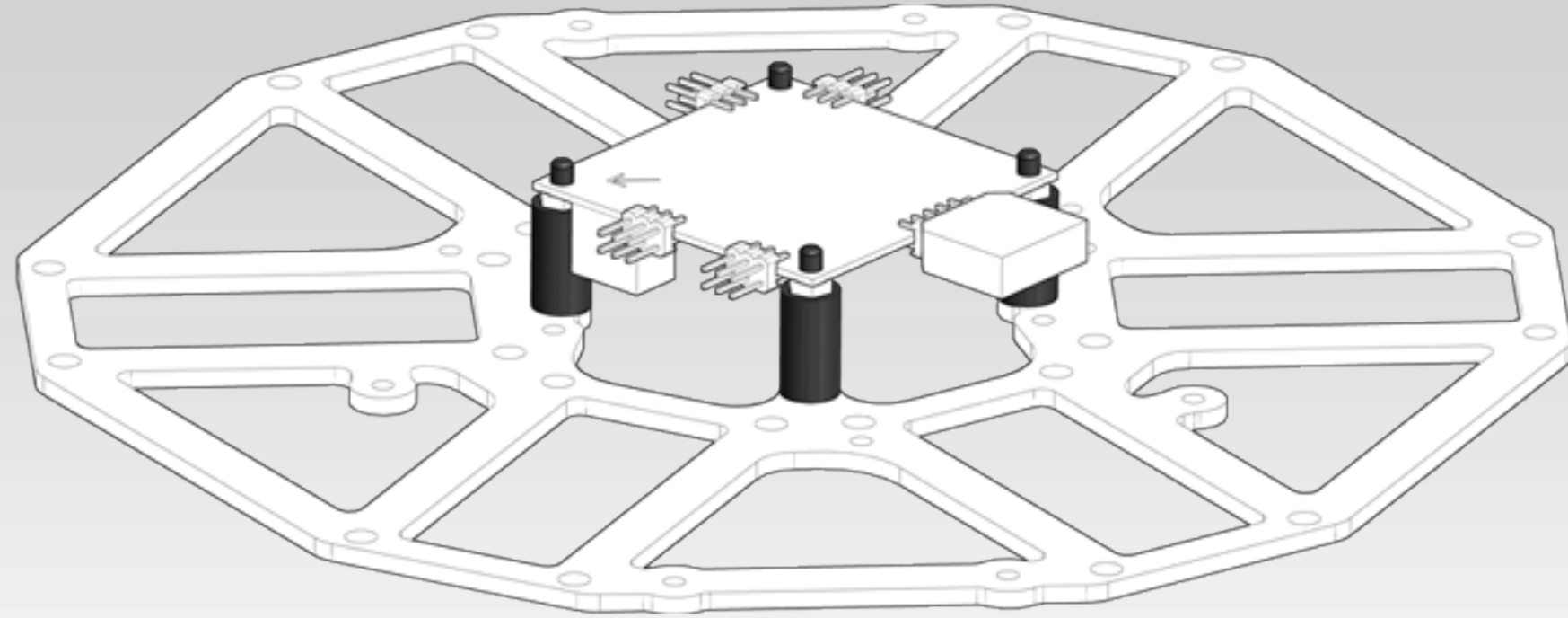
MKE5.3 Thread the MK flight control vibration isolation mounts onto the M3x6 BHCS.

4



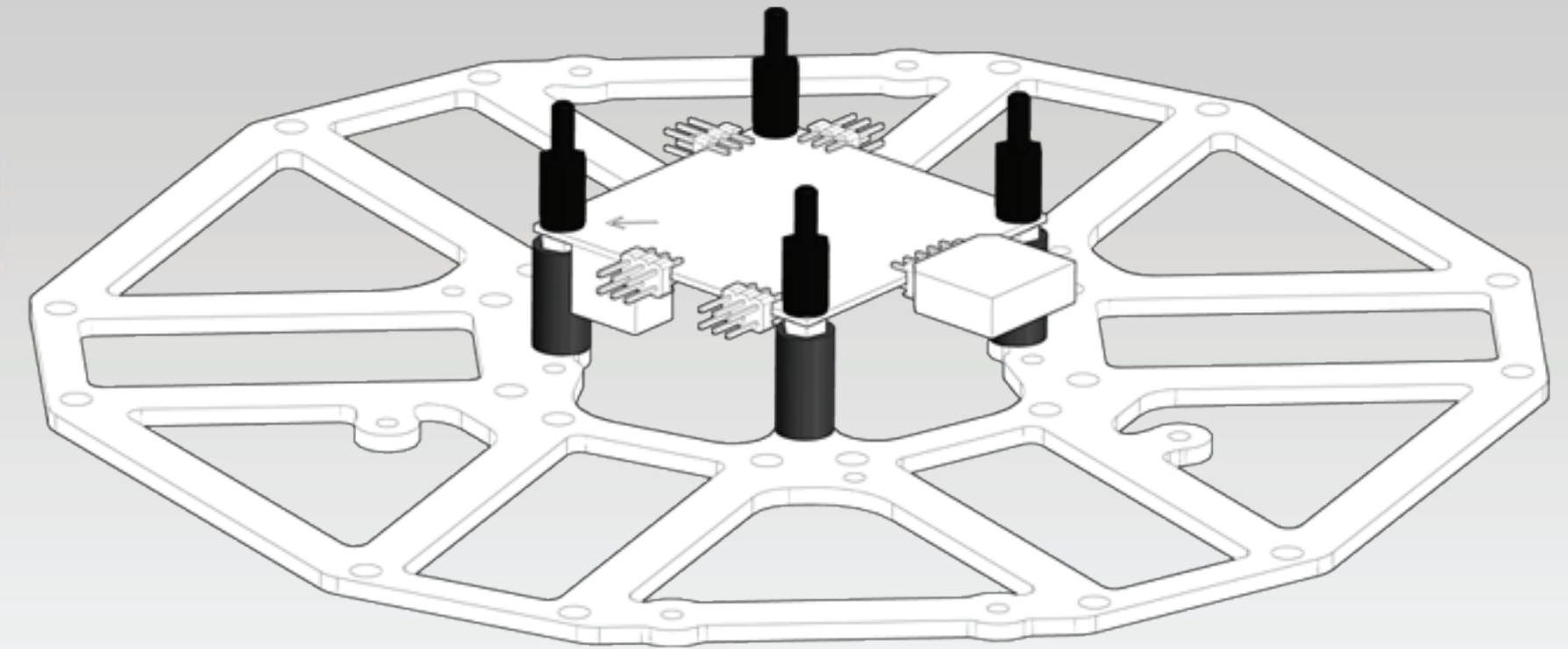
MKE5.4 Thread the M3 nylon nuts onto the 3mm vibration isolator studs. These will act as spacers, so that the flight control board has adequate clearance from the distribution board.

5



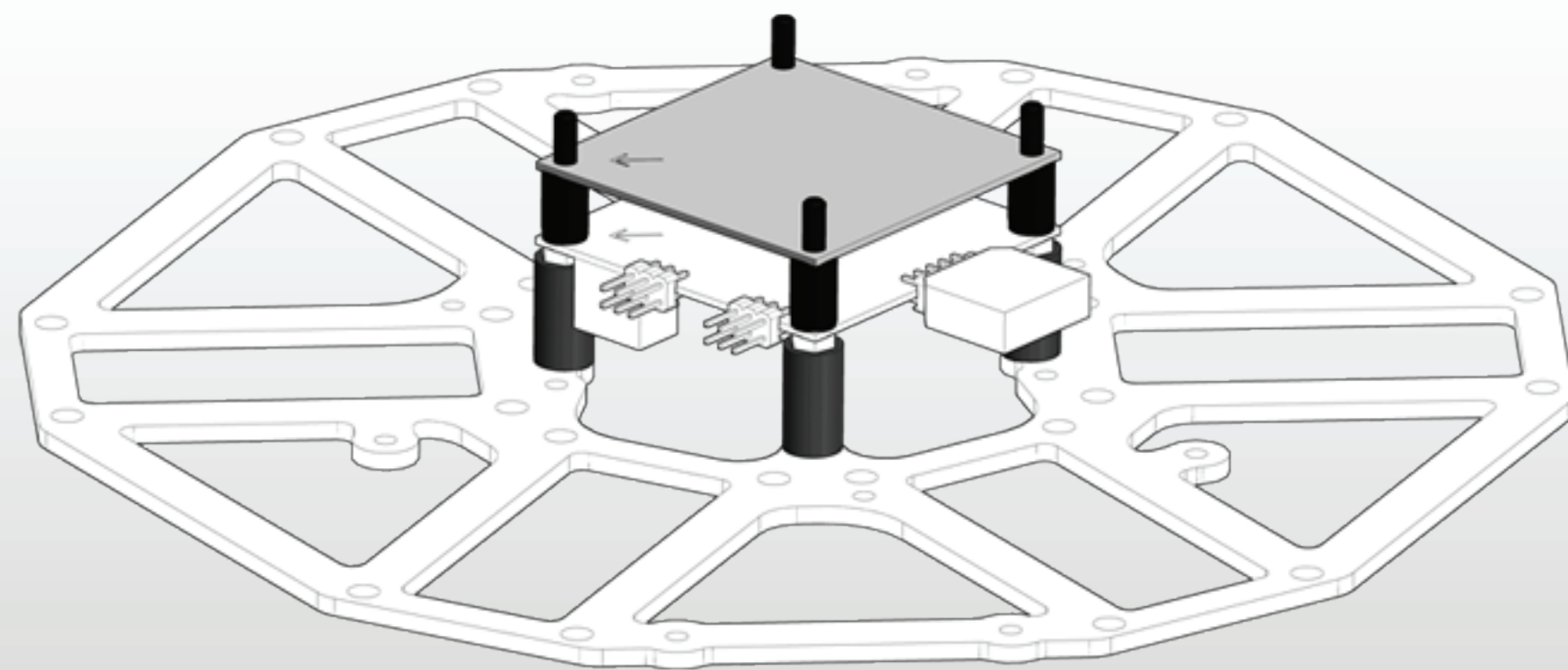
MKE5.5 Mount the flight control board onto the vibration isolation mounts, being careful to observe proper orientation. The flight control board has a small arrow that should be aligned as shown in the drawing.

6



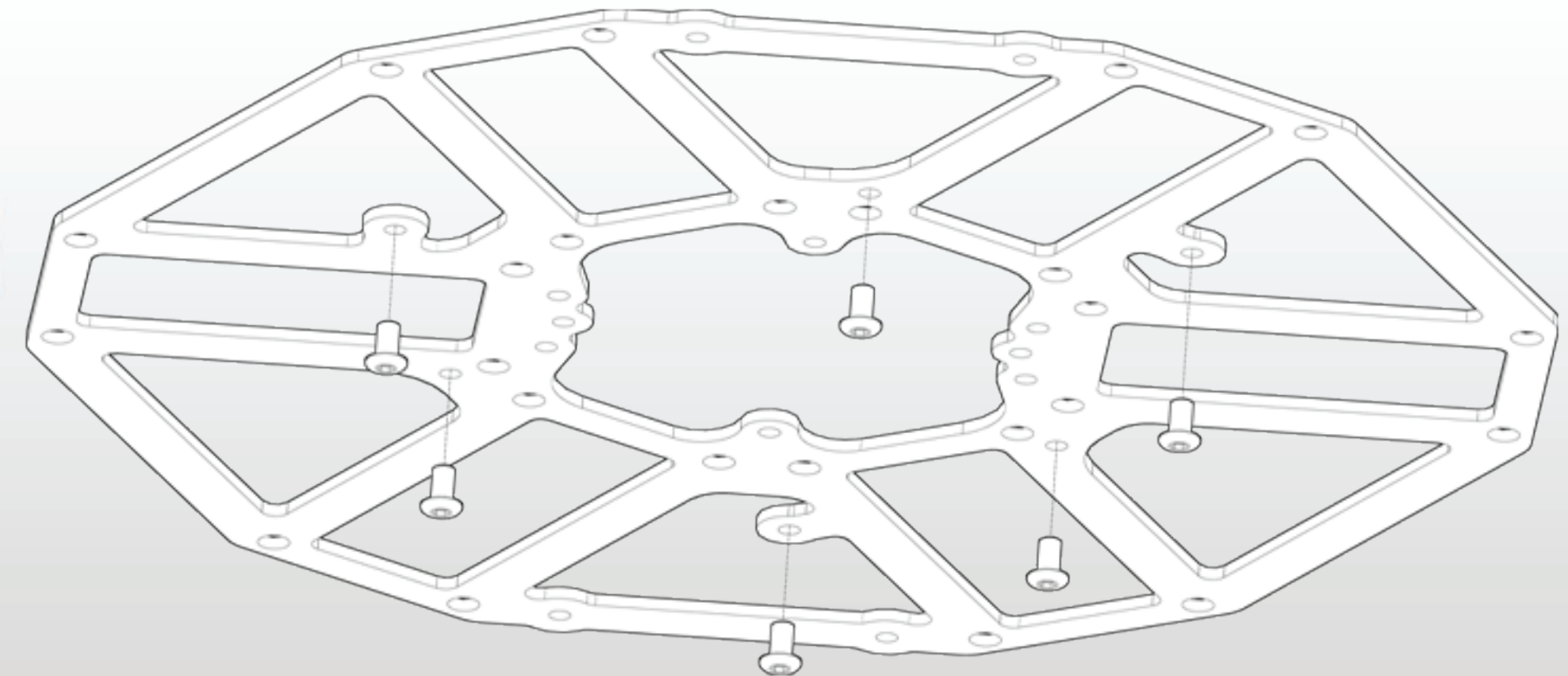
MKE5.6 Install the four (4) nylon standoffs onto the existing studs of the flight control vibration isolation mounts.

7



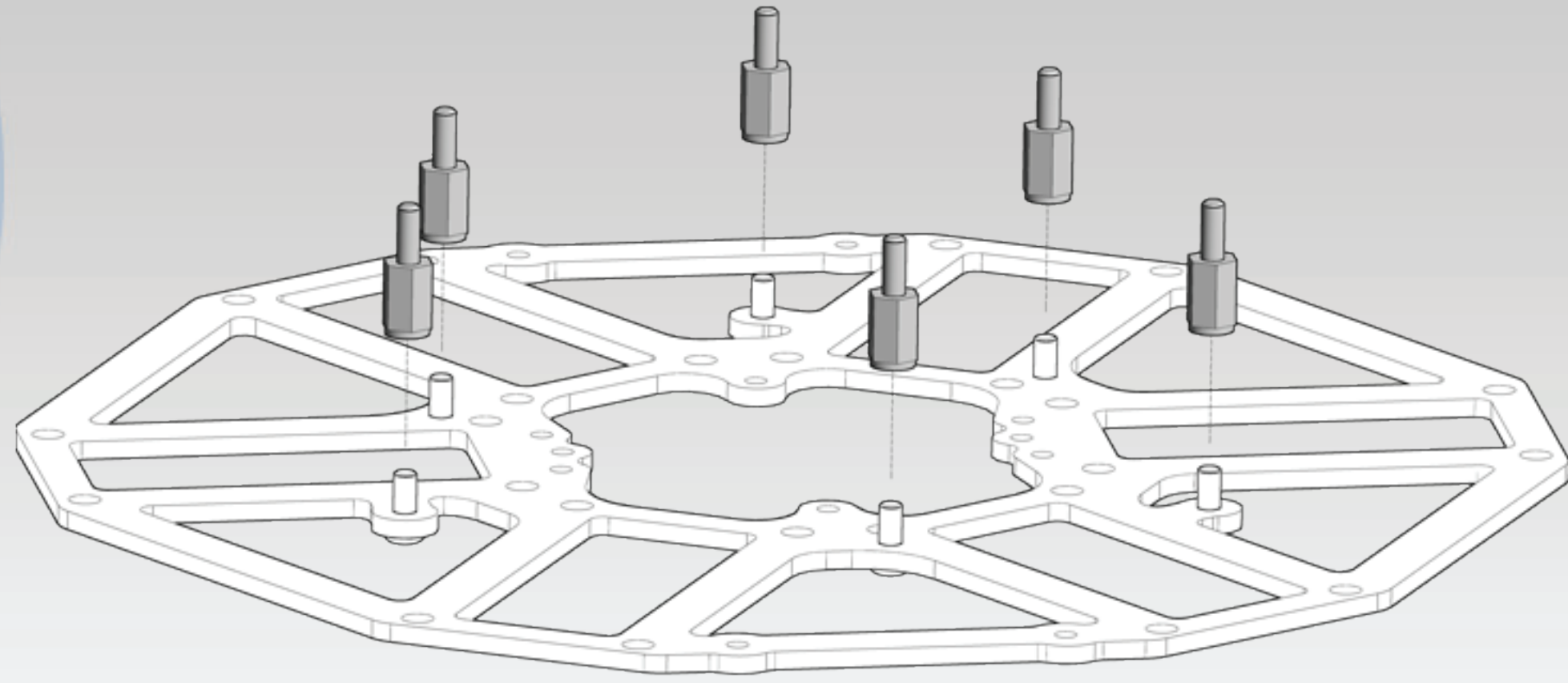
MKE5.7 Install the Navi-Ctrl board, being careful again to observe proper orientation and carefully tighten the 3mm nylon nuts to secure the board.

8



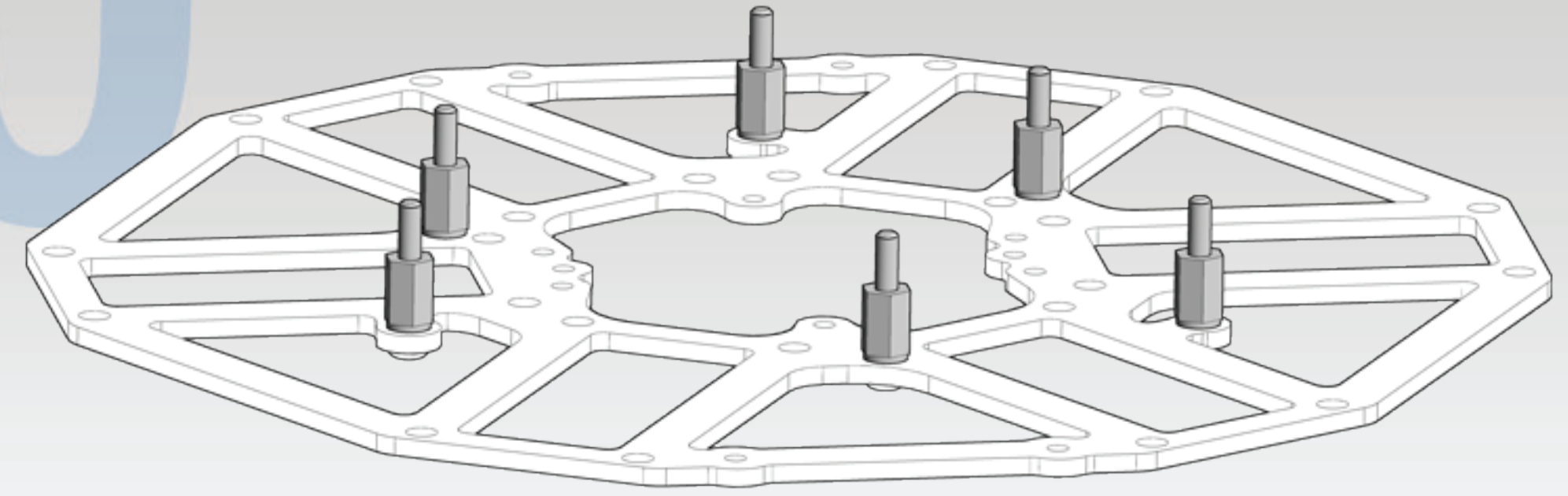
MKE5.8 Now we will install the distribution ring. Once again, for the ease of viewing, the top frame plate is shown without the MK electronics stack we just assembled. Insert six (6) M3x6 BHCS into the holes shown.

9



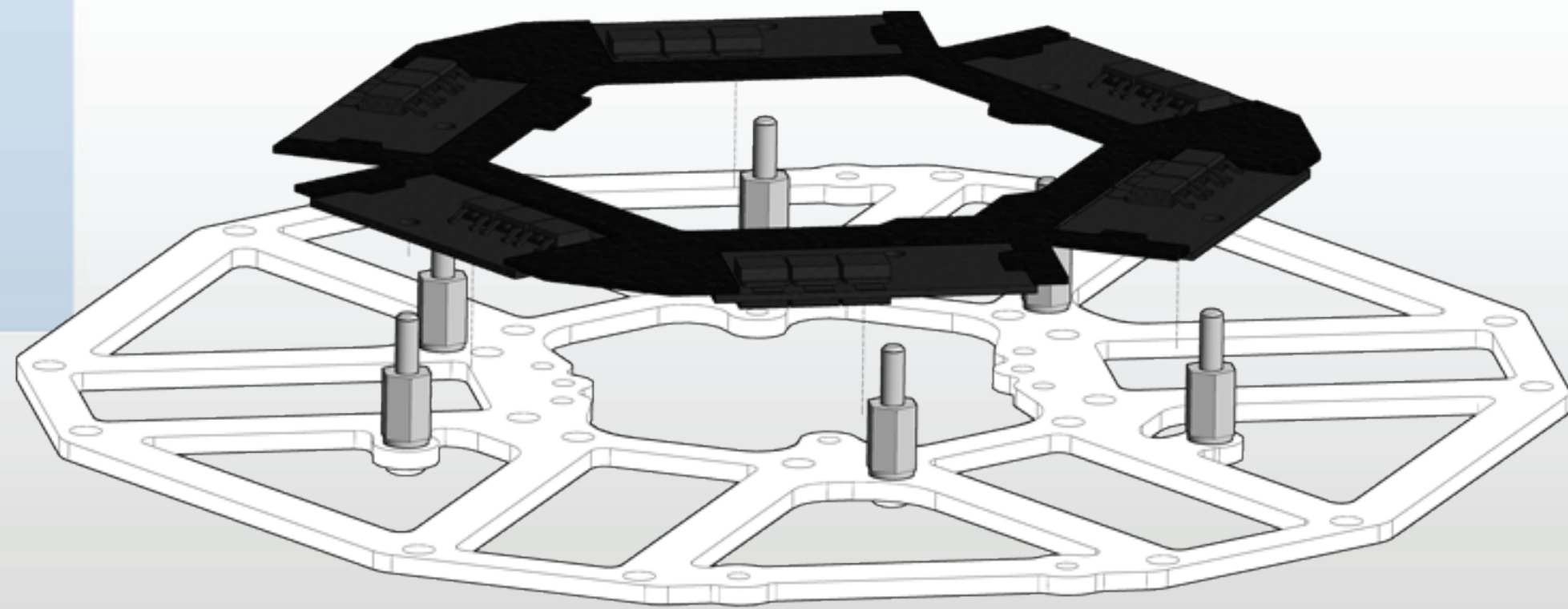
MKE5.9 Thread the 10mm nylon standoffs onto the M3x6 BHCS. Be careful not to strip the nylon threads.

10



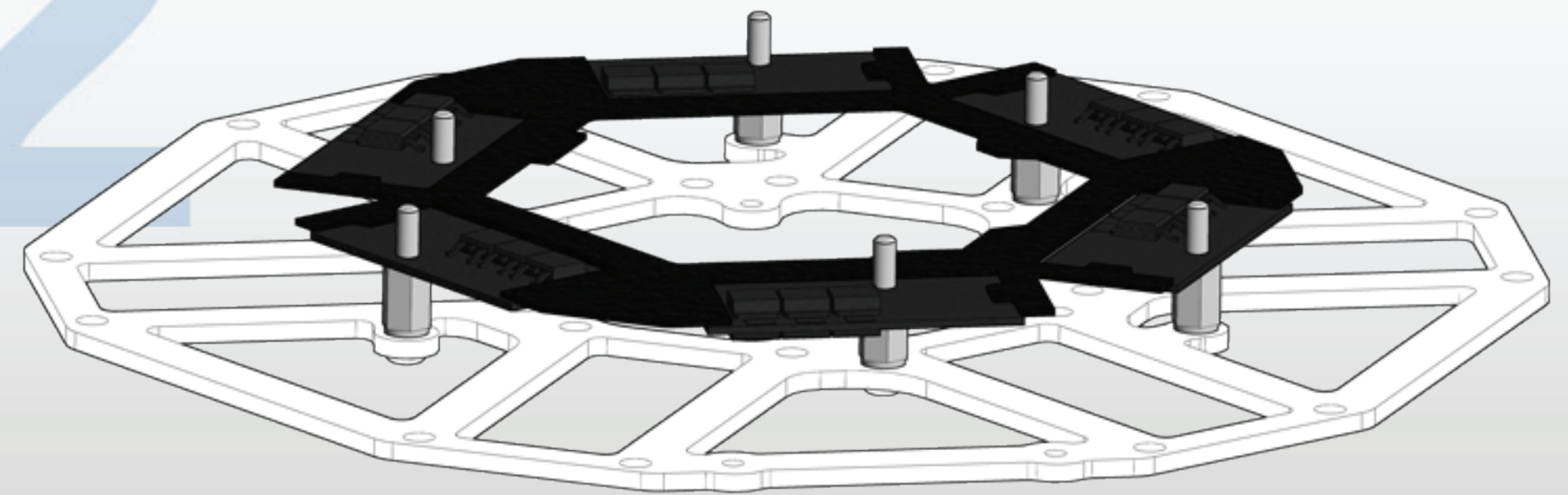
MKE5.10 Nylon standoffs installed.

11



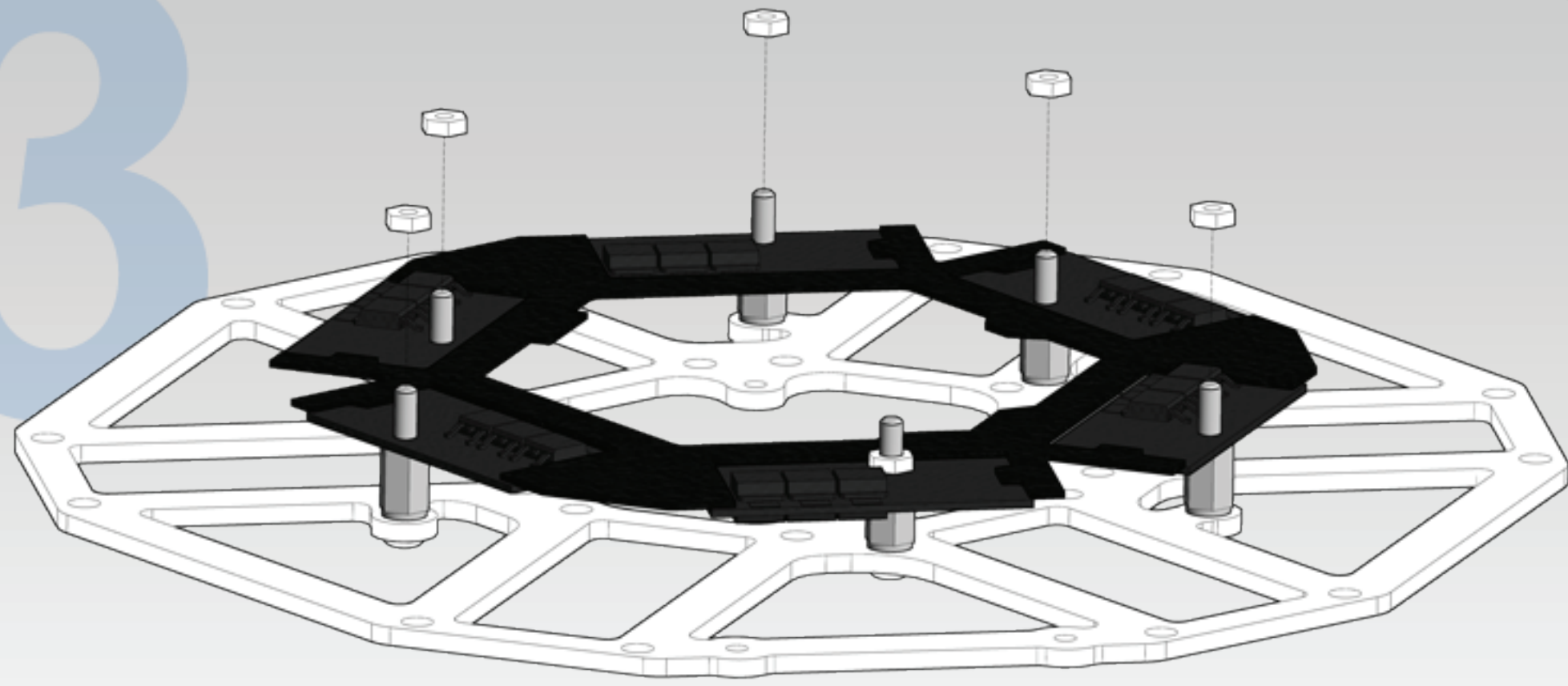
MKE5.11 Now place the MK distribution ring onto the nylon standoffs.

12

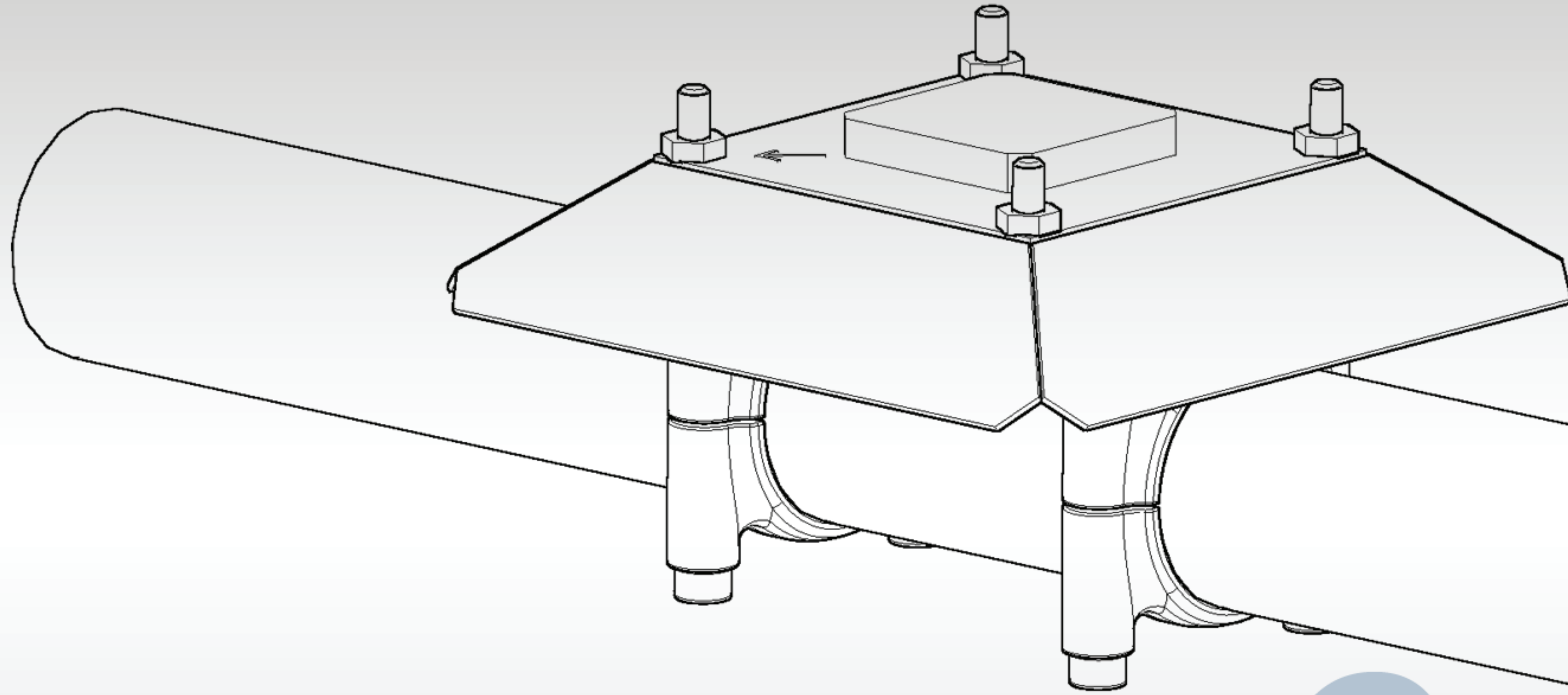


MKE5.12 Distribution ring installed onto nylon standoffs.

13



MKE5.13 Install the nylon nuts to retain the distribution ring.

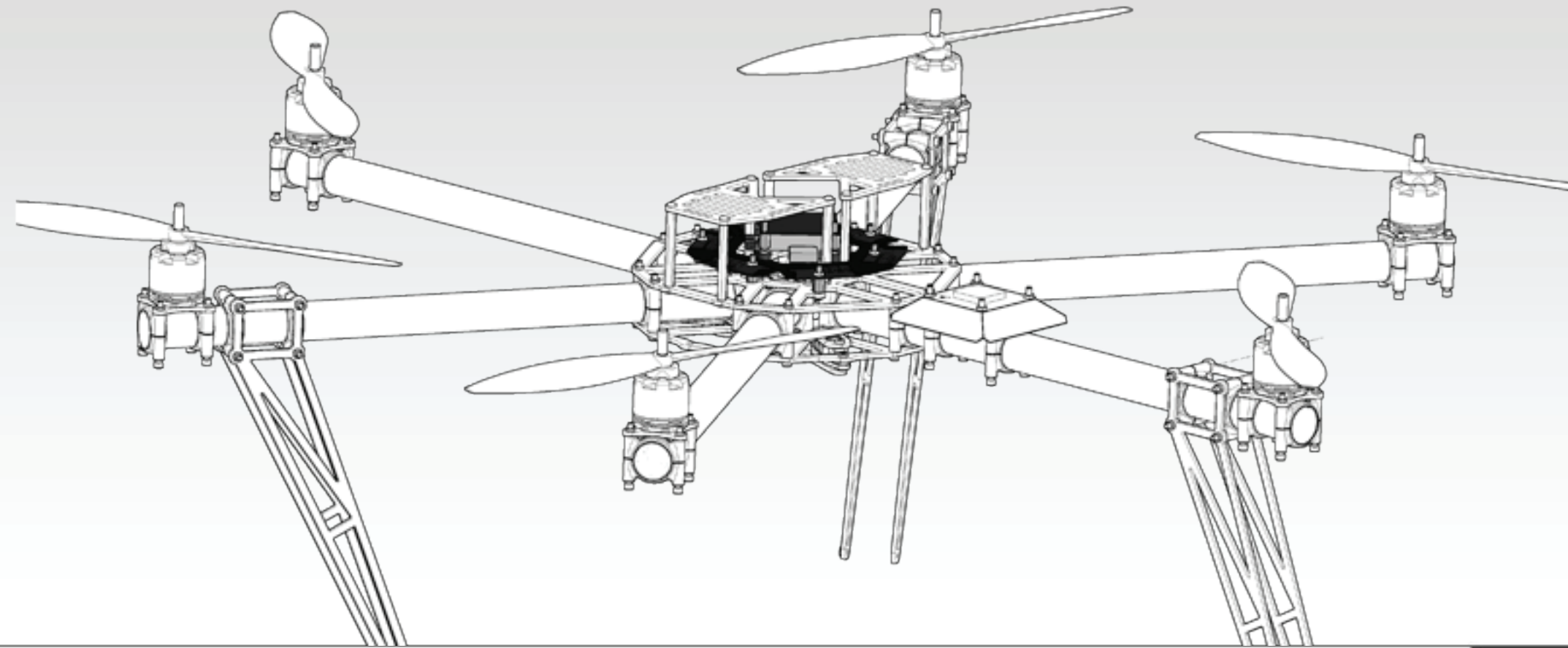


6

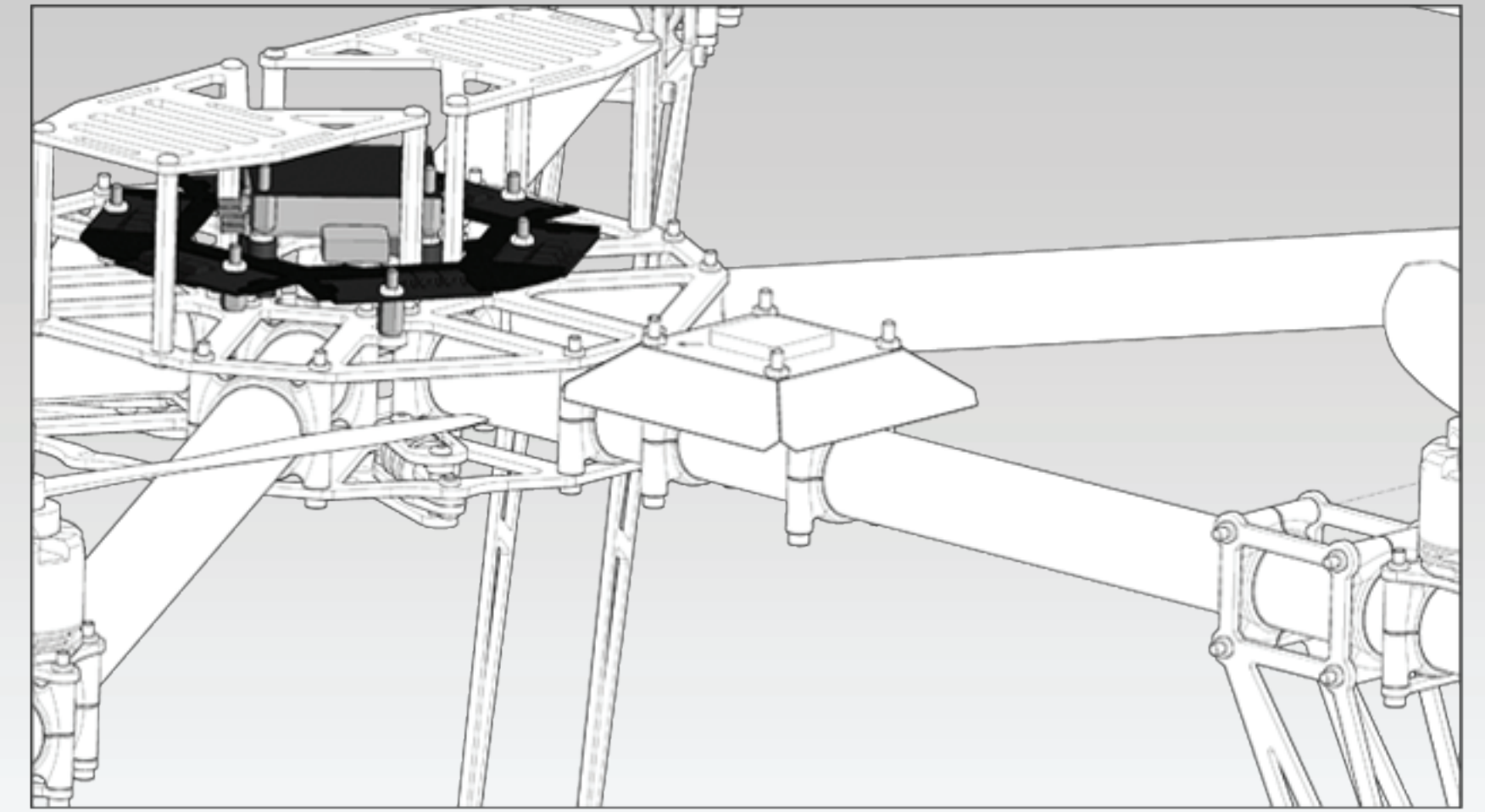
GPS
(GPS6.1 - GPS6.11)

1

GPS6.1 If you choose to run the MK GPS with the GPS shield, it will not fit in the stock mounting location. For this reason, we have included an accessory mount for the GPS shield that allows for it to be mounted on a boom.

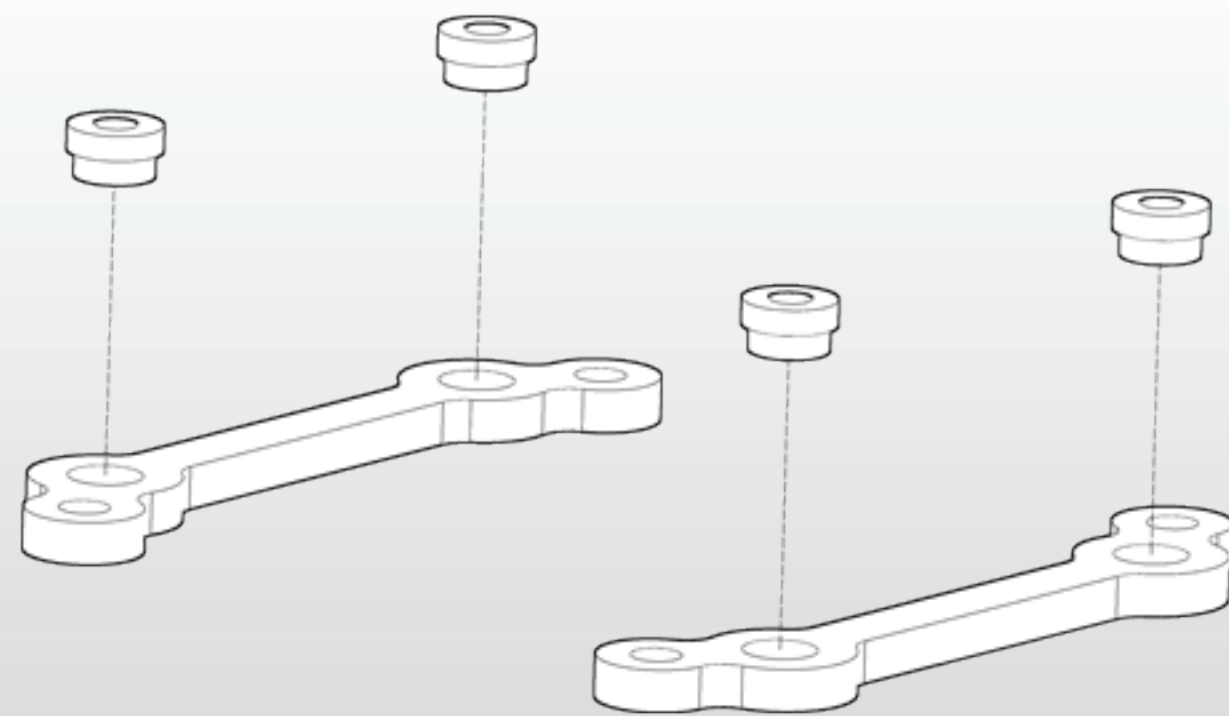


2



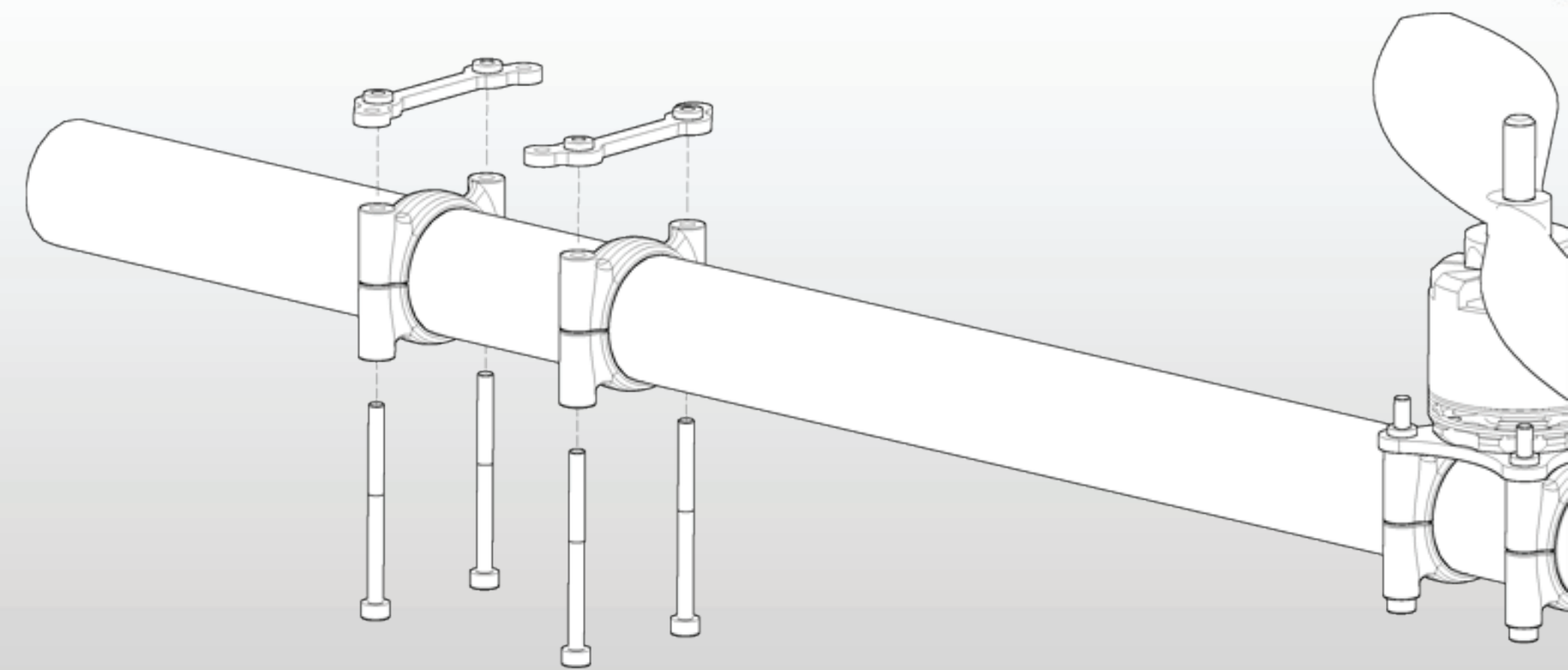
GPS6.2 Close-up of the GPS shield mounted on the accessory mount.

3



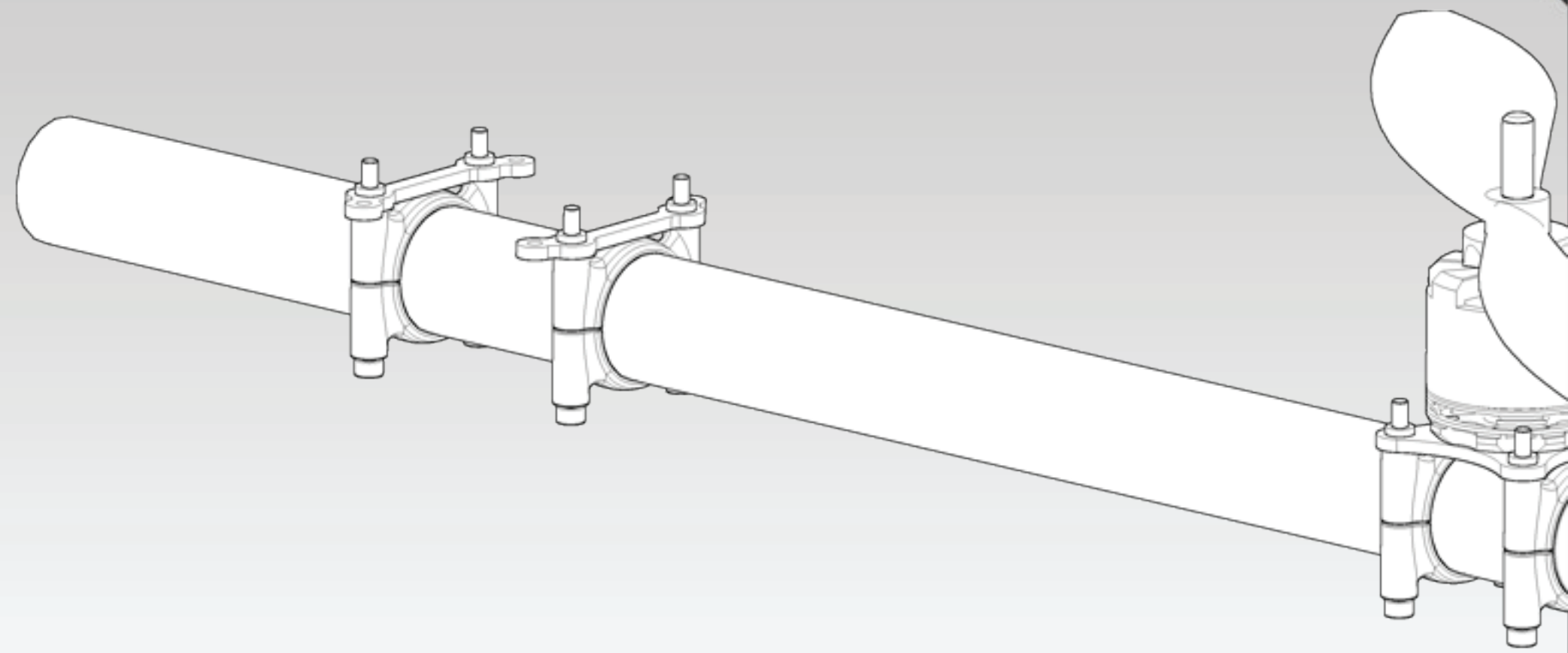
GPS6.3 Install 3mm press nuts into the GPS mount bars.

4



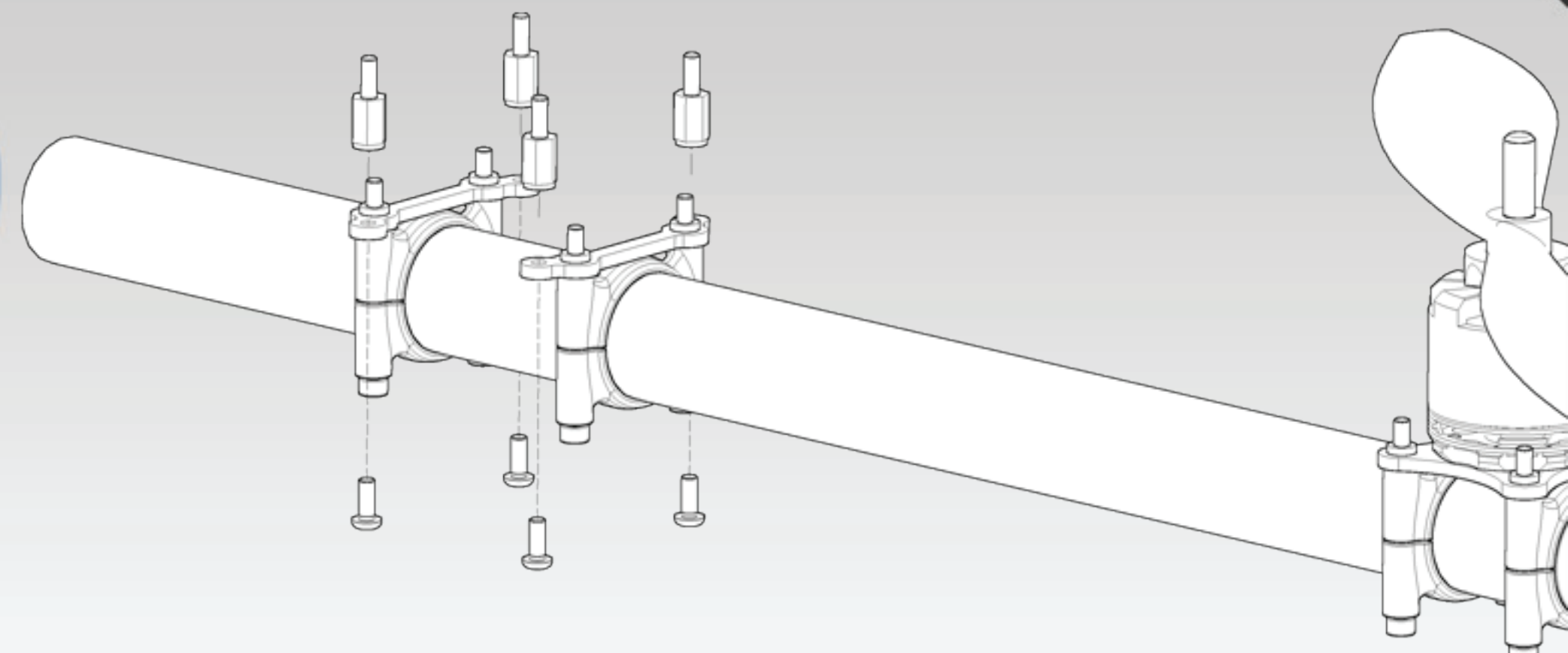
GPS6.4 Install four (4) M3x35 screws through the four(4) clamp halves into the press nuts in the GPS mount plates.

5



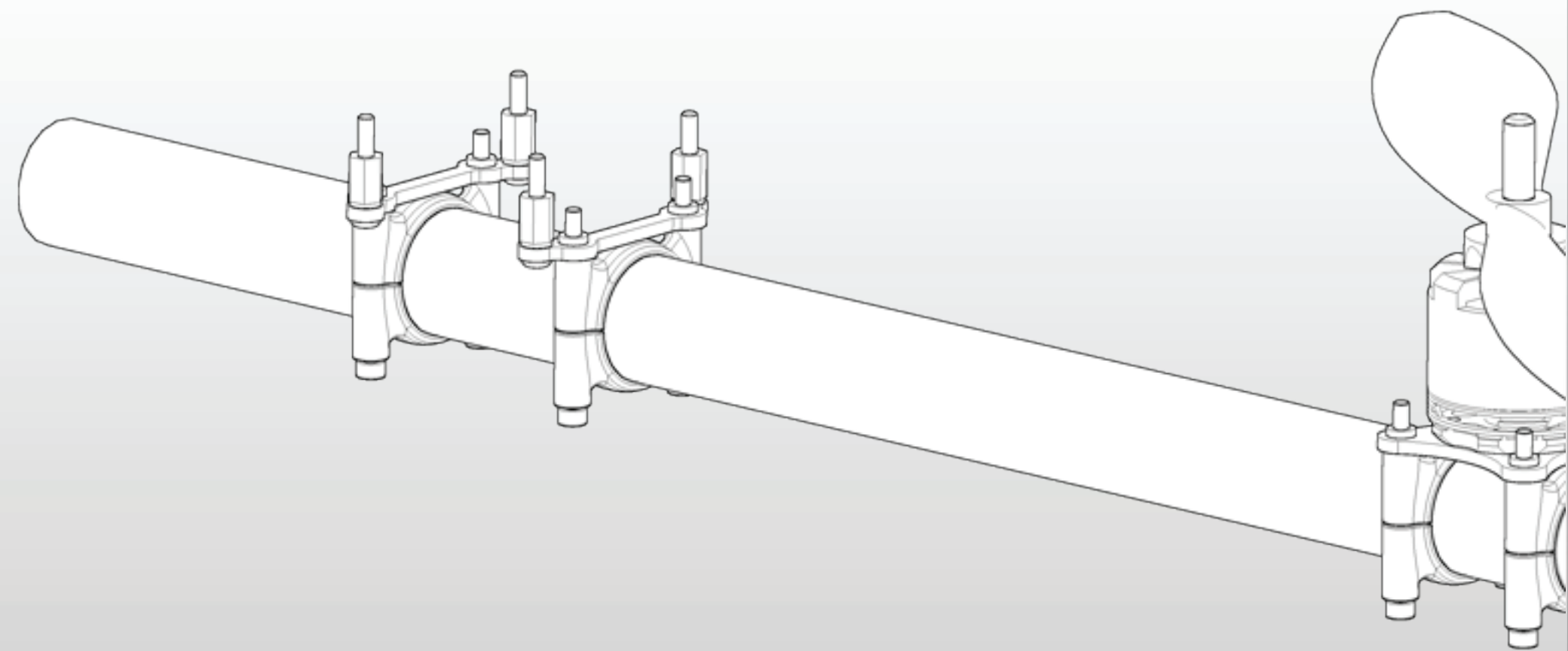
GPS6.5 GPS mount plates installed.

6



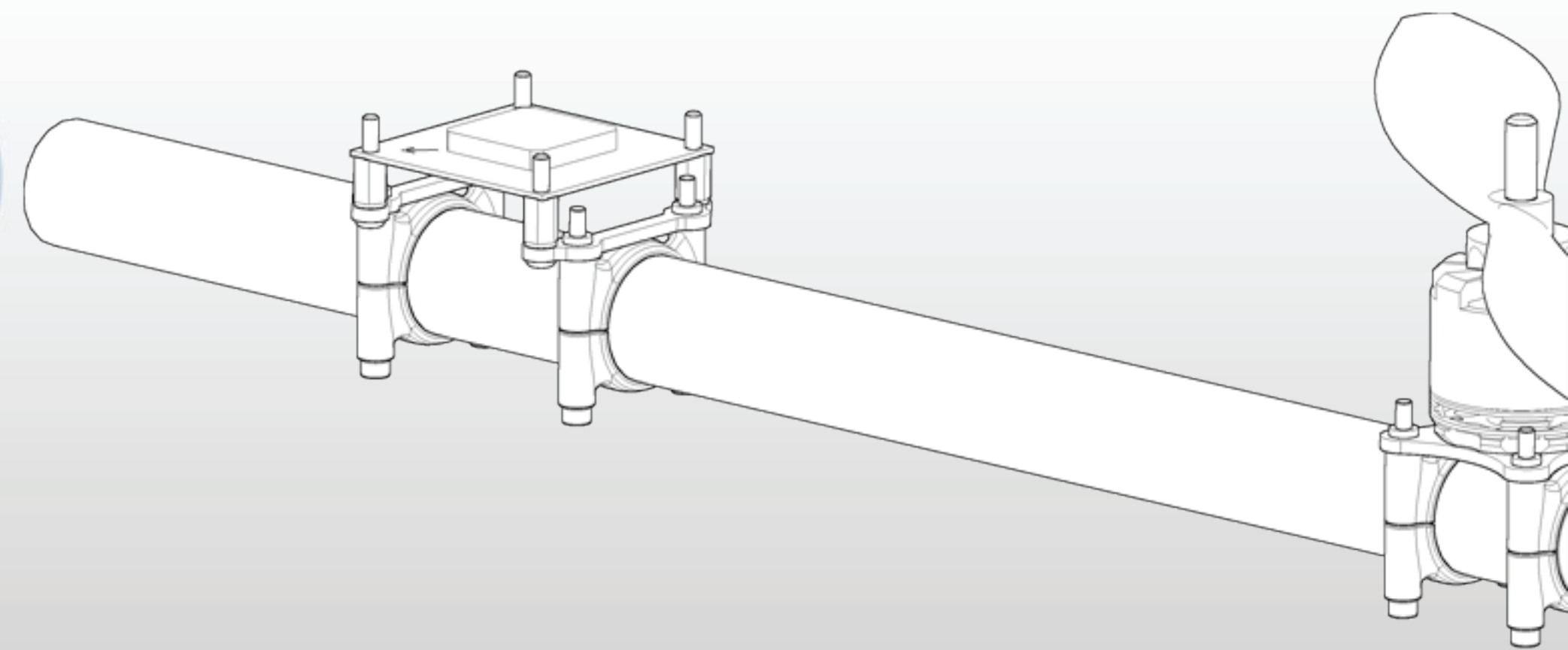
GPS6.6 Attach four (4) nylon standoffs using M3x6 BHCS.

7



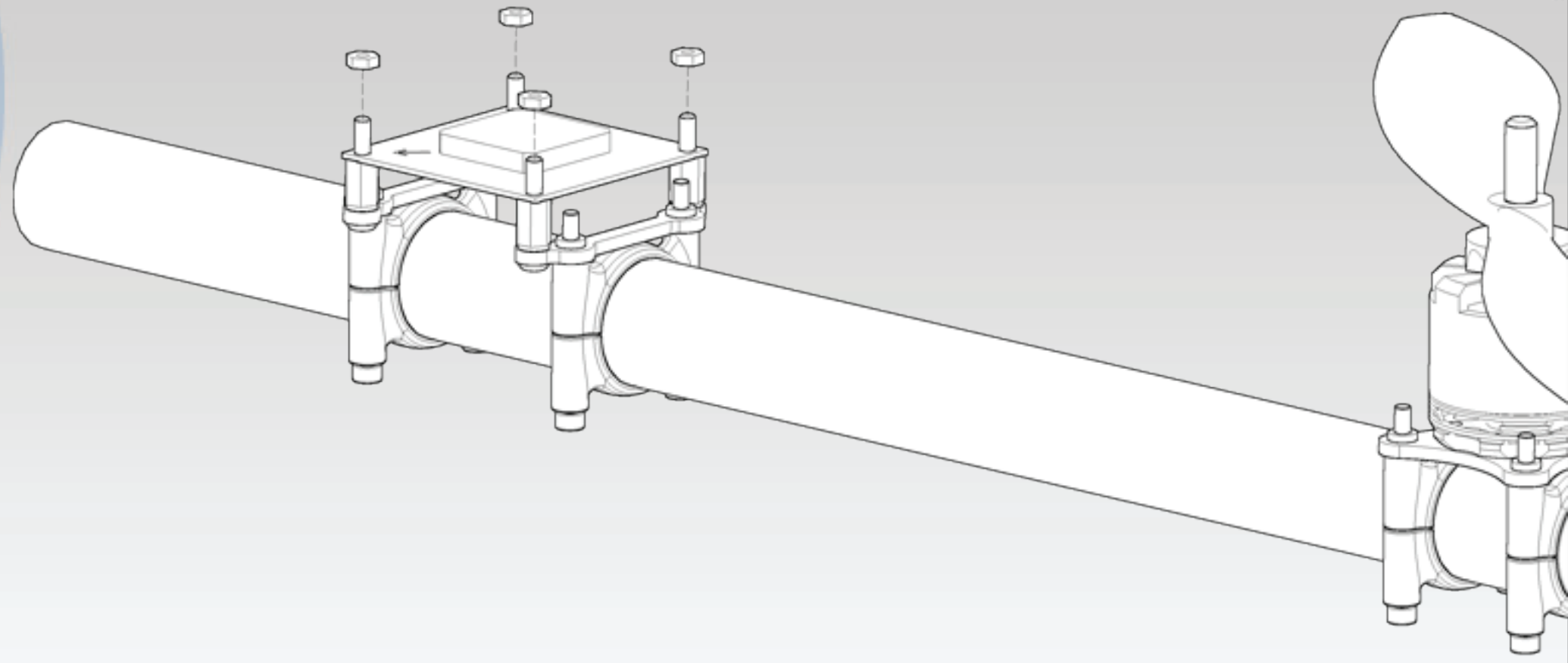
GPS6.7 Nylon standoffs installed.

8



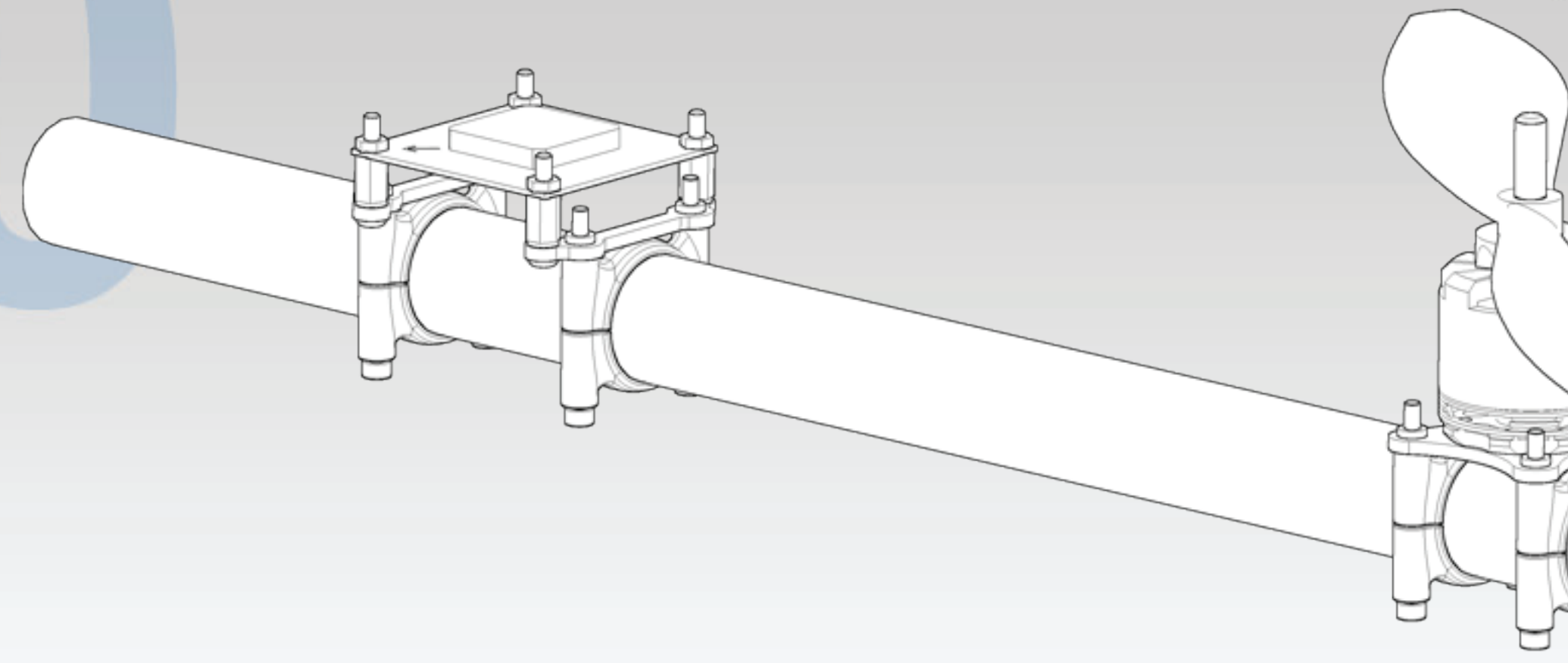
GPS6.8 Install the MK GPS board (note the GPS shield is not shown for the ease of illustration).

9



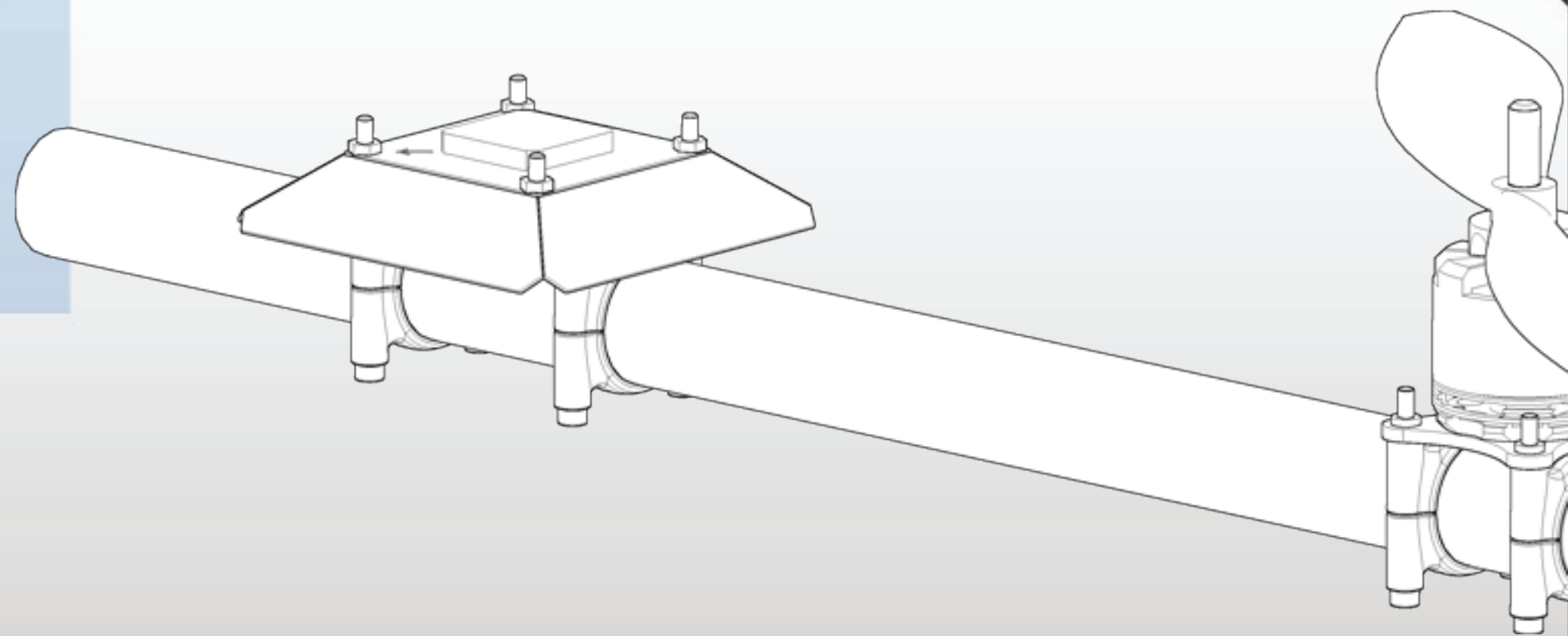
GPS6.9 Secure GPS board with nylon nuts.

10

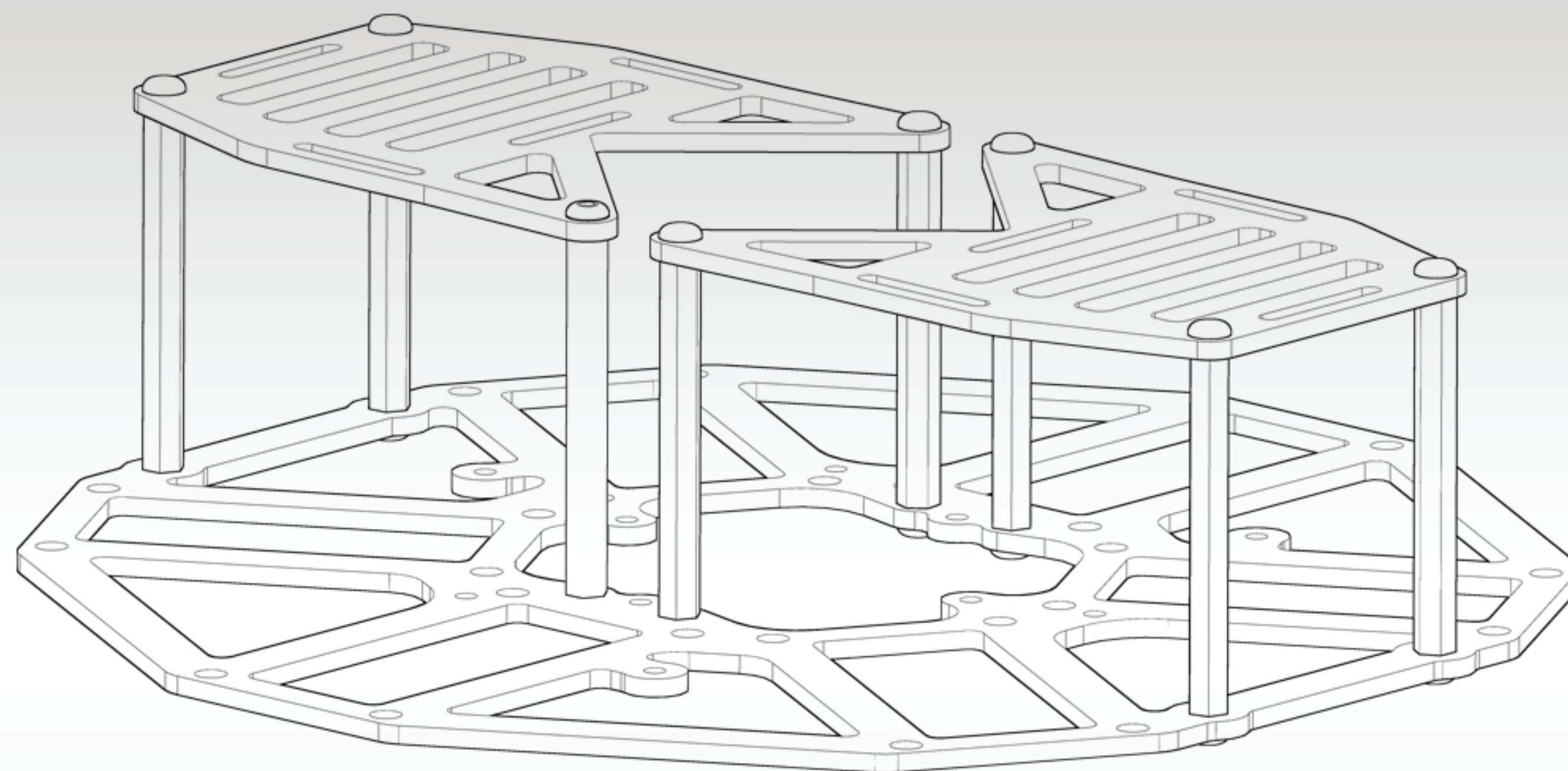


GPS6.10 GPS board and nylon nuts installed.

11



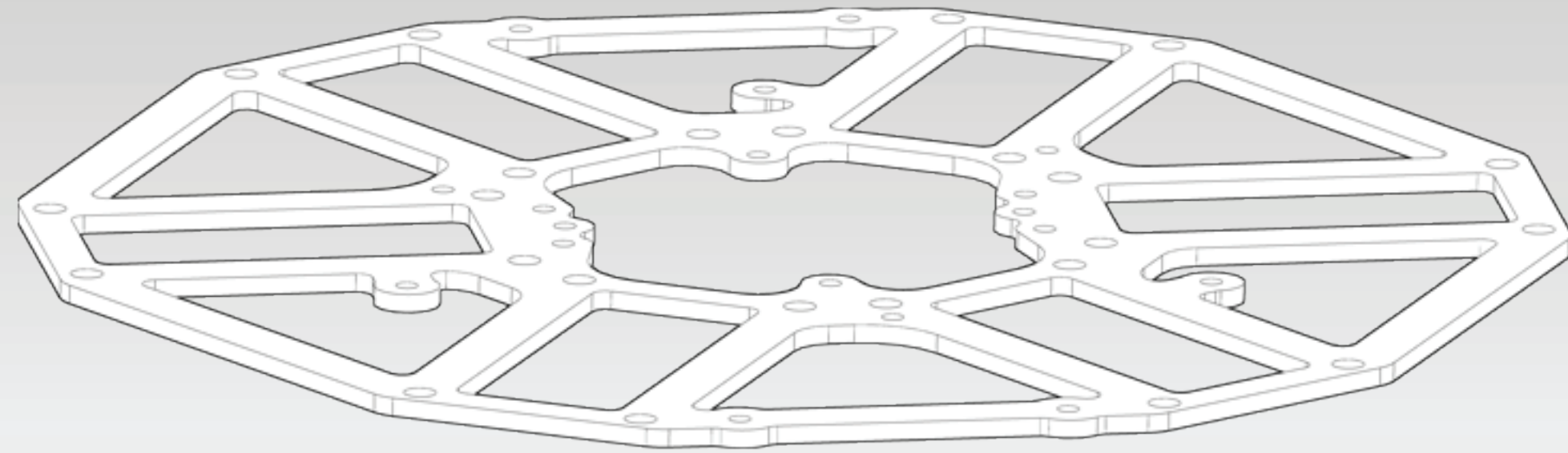
GPS6.11 Completed GPS assembly with shield.



7

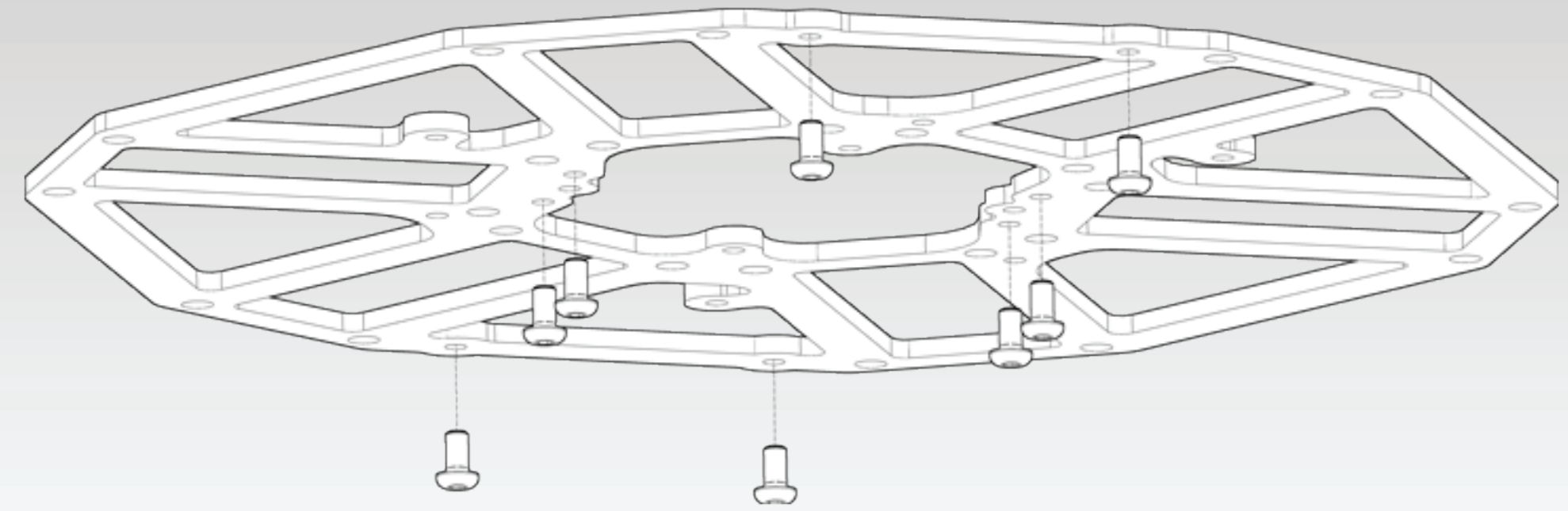
BATTERY PLATE
(BP7.1 - BP7.5)

1



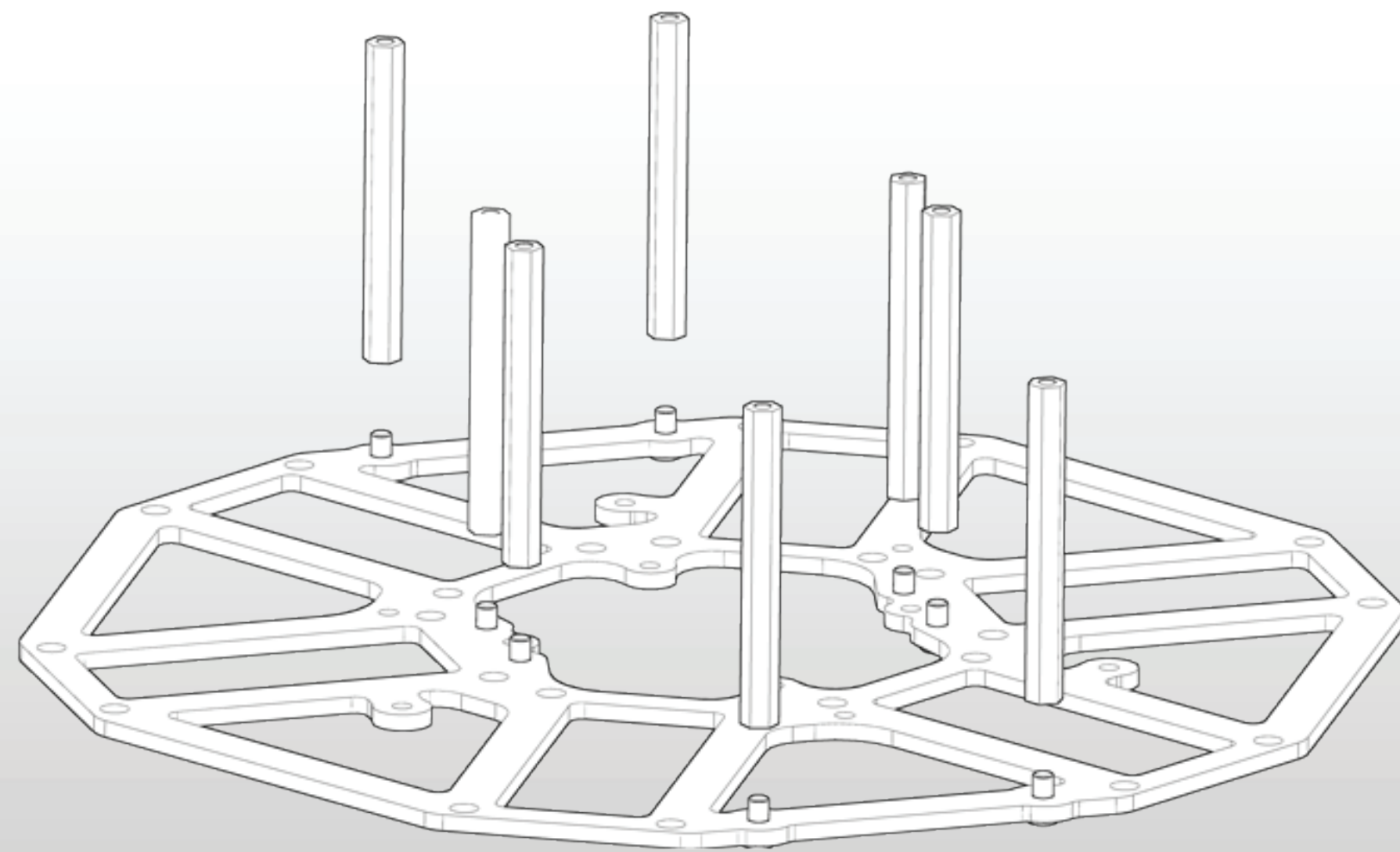
BP7.1 Now we need to install the two (2) battery trays.

2



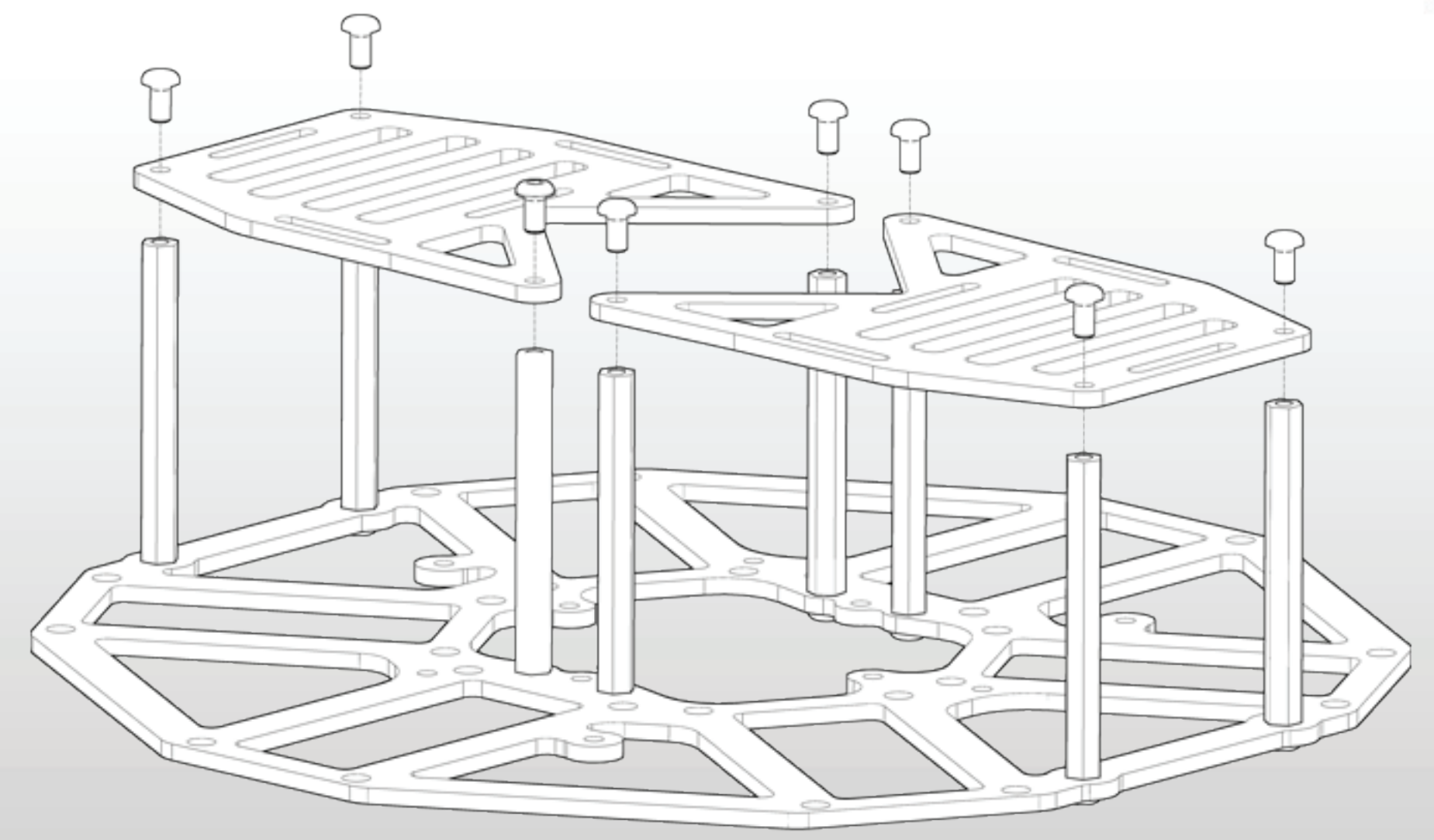
BP7.2 Insert eight (8) M3x6 BHCS into the holes in the top frame plate as shown in the drawing.

3



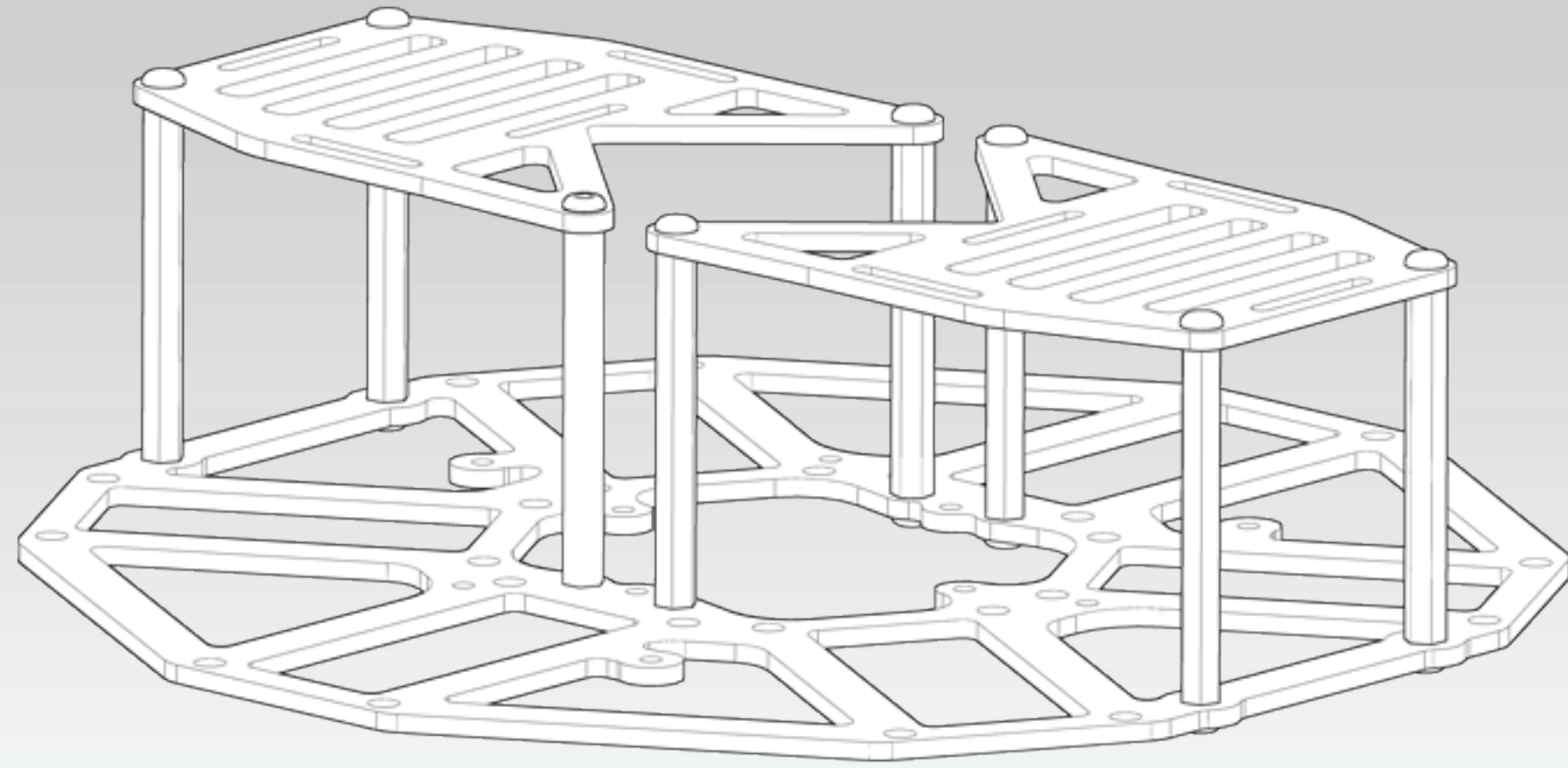
BP7.3 Thread the eight (8) 50mm aluminum standoffs onto the M3x6 BHCS.

4



BP7.4 Thread eight (8) M3x6 BHCS through the battery trays and into the 50 mm aluminum standoffs.

5



BP7.5 Assembled battery plates.

